

COMPUTERVIEW

The Conservative victory at the election puts a question-mark over the new government's attitudes to computing and microelectronics. We put our views here in an open letter to the new Prime Minister.

DEAR MRS THATCHER,
Well, you've done it. You've led your party to victory. And you are no doubt quite justifiably proud to be the first woman Prime Minister.

But despite the euphoria and the Champagne, real life goes on and the hopes and fears of millions are bound up in the decisions which you and your Ministers will be taking in the weeks and months ahead.

You may feel that with inflation, unemployment, the unions, Northern Ireland and the Common Market you have problems enough to consider. However, I make no apology for drawing your attention to another subject, or rather two related subjects — computers and the

An open letter to Mrs Thatcher

growth of an "Information society" — which require your urgent attention.

Urgent? Yes, because they will increasingly shape our future and decisions about industrial strategy, support and intervention in the computer field, which may seem to be of relatively low priority compared with some of the burning issues which you are now facing, but may have very considerable long-term significance.

My use of the word "intervention" was intentional because although it may arouse much the same sort of reaction in the hard-line Tory that the word "profits" provokes in the dyed-in-the-wool Socialist, it is a great deal more than just a dirty word.

Intervention is an essential tool of government in any modern state and that includes such supposed bastions of free enterprise as the US, Japan and France.

Now is the time to drop the

dogma which appears to be an inescapable feature of election campaigns and to adopt a more pragmatic approach in which intervention will undoubtedly play its part. But let us look at some specific situations which demand such an approach.

First and foremost the National Enterprise Board, which has taken such a hammering from Tory critics, must stay. It is not just that the need to restructure British industry is self-evident, but that market forces and conventional sources of capital have not proved to be adequate agents of change in our society.

The NEB, if used wisely, can be such an agent of change, as has been demonstrated by the formation of Inspec and Inmos, rather than being regarded merely as a repository for lame-duck industries. Indeed, now that the need to encourage innovation by assisting in the formation of small companies is widely appreciated the role of the NEB could, if anything, be

widened. Please do not succumb to the arguments of financial experts like Mr du Cann, who may well advise you that adequate sources of risk capital for companies engaged in technological innovation already exist. It is the business of the City to make money and the business of the government to look after the national interest. The two ends do not always coincide.

Speaking of the NEB inevitably raises the question of Inmos and the initiatives taken by the Labour government to promote the understanding and use of microelectronics in the UK. The fact that Jim Callaghan seemed to be making the microcomputer revolution his own personal crusade should not blind you to the merits of the case.

A national capability in the design and use of microelectronics is important. And while the degree to which we apply microprocessors may be more significant than manufacturing

them, the Inmos experiment is a far-sighted and imaginative attempt to obtain a British foothold in an industry dominated by the US and Japan. Vision of the sort which was required to back Inmos is not such a common feature of government that you can afford to reject it out of hand.

Although microelectronics has seized the public imagination, it must not be forgotten that the NEB has substantial holdings in ICL, Ferranti and Data Recording Instrument Co. The suggestion that such investments should be sold off will strike many as a strange way in which to treat national assets which have been built up with the aid of the taxpayers' money. Moreover the possibility that sizeable interests in companies like ICL and Ferranti could fall into foreign hands is totally unacceptable.

These are just a few of the issues which are raised by your victory at the polls. But they are certainly not the only ones which are of concern to those with an interest in the computer industry and the impact of computers on our society.

The provision of computer education for secondary school children is, for example, an issue which has been taken up at national level in the US and France, to name only two countries which are planning to make microcomputers widely available throughout their secondary education system.

Yes, intervention again. But to abjure it for reasons of party dogma would be to deprive the UK of the support which, in an increasingly competitive world, other governments are providing.

Please forgive the length of this letter, but these issues are important. Yours sincerely,

AWEIL-WISHER

Ten years ago...

COMPUTER WEEKLY

MAY 8, 1969

ONLY £250 million was spent in the US in 1968 on proprietary packages, of the £14,000 million which went on development and purchase of computer programs... Prime Minister Harold Wilson replied to a question in the Commons that computerisation in the Civil Service was proceeding quickly... UCC of Dallas took over Data... The USAF Defense Command awarded RCA two contracts, totalling \$1.7 million for expansion of the missile warning display system.

Marketing man wins Coventry

COVENTRY South-West was won in the General Election by the Tory candidate, John Butcher, regional marketing manager of General Computer Systems. The Conservatives gained the seat from Labour with a majority of 5,654.

Computer people who were unsuccessful candidates in the General Election included Philip Rule (Liberal) at Lichfield and Tamworth, another seat which the Tories gained. Rule received 7,408 votes.

In Chertsey and Walton, Shaun O'Byrne, a consultant with Logica, received 12,211 votes for Labour and the Liberal candidate, for Acton, Simon Rowley, polled 3,549 votes. He is a salesman with Euracom.

The Liberal party was represented in the Labour seat of Islington Central by Marge Dunn, administrative manager of the IDPM, who received 2,342 votes.

Europe can succeed in semicons in the long term

Martin Banks reports from New Orleans

THE opportunities are there for European companies to succeed in the world semiconductor market, but it will take the next decade to achieve this. This view was expressed by Dr Gernot Oswald, a Siemens vice-president, speaking at the Morgan Stanley Semiconductor Forum in New Orleans last week.

He suggested that the growing influence of systems-based requirements was producing a need to concentrate on sophisticated components, which included not only microprocessors, but also interface and controller chips.

Discussing the development of the industry and the recession that had been forecast, Jerry Sanders, chairman of Advanced Micro Devices, said that silicon processing is today's crude oil, itself a factor in the last recession in 1974. Customers, he said, were now coming to AMD to discuss long-term plans and requirements.

He highlighted the major shortfall areas in the semiconductor industry. These included the MOS business generally, which was currently running up to 50% greater bookings from customers than billings to customers. Also, low-power Schottky products had severe capacity limitations and this

situation, he thought, would get worse next year.

Sanders said that IBM had been to AMD to try to find its 1980 components in this area without, it appeared, any success.

The Morgan Stanley forum also covered the personal computer market, and dealing with the development of these systems as communications tools. Jeffrey Krauss, Federal Communications Commission associate director of plans and policy, said the FCC would not be a barrier to the growth of this market.

American manufacturers already saw communications as one of the major areas for growth, and Krauss said this would be encouraged by the FCC.

He did, however, point to two possible problems that might be encountered. The first was the price rate structures in communications which were, he said, wrong.

The second problem was the potential threat that existing common carriers would get personal computer manufacturers included among their number. Krauss could see no reason to regulate personal computers as common carriers.

Profile of the power of IBM's H series

A US basing and finance company has done some sums and come up with a performance profile for IBM's forthcoming H series, scheduled to replace the 3033 line.

Computer Financial Inc of New Jersey, in the French weekly *Ordinateurs*, quotes four H-series models. At the top is a formidable machine with a rating of 15 mips, three times that of the 3033, and up to 40 Megabytes of main memory. Price for such a processor is estimated to be about \$5 million.

At present, no production machine is installed with more than 16 Megabytes of main memory, although a new 32-bit back-end processor from Norsk Data will offer up to 32 Megabytes of extended main memory.

The next H model, says CF1, will have a mip rating of 11, and up to 24 Megabytes of memory for \$3.5 million. The direct replacement for the 3033 will be a little more powerful but cost about half as much, \$1.9 million.

Smallest systems will be a 3032 replacement with 8 Megabytes of main memory, a mip rating of 3.2 (compared with 2.75 for the 3032), costing \$1 million, less than half the price for a four Megabyte 3032.

Other forecasters expect the H series to include a diversity of specialised processors within the central processing unit, each running a part of MVS. However, it is thought that this may initially be confined to a separate database processor, since any too radical a change could frighten users into the arms of Amdahl and ITEL.

Govt panel sought for Welsh computer education

CONCERN over the future of computer education in Wales has led to the Welsh Joint Education Committee being asked to set up a special panel to look at the problems and to co-ordinate the efforts of funding bodies, government departments, schools and colleges, and industry.

According to John Davies, head of the WJEC's further education department, the principal problem is lack of resources, and so he wants the panel to involve the agencies

that provide funds, such as the Manpower Services Commission and the Department of Industry.

To this end he has had meetings with these bodies as well as with the Welsh Office education department, the DES, and the Council for Educational Technology.

Welsh industry will also be consulted to establish its needs. Then the main task will be familiarisation of teachers, and in-service training.

1984 and all that...

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Bottom-end bargain sale at IBM

THE General Systems Division of IBM is holding a clearance sale of its bottom-end CPUs. Involved are the almost-defunct 5100 and System 32 and the company's leading low-cost business product, the 5110.

Most dramatic are the cuts on the purchase prices of the System 32 office computer, which come down 30% across the board, cutting it to £14,054 to £21,606, depending on the size of integral disc. It was previously in the £20,000 to £30,000 range.

System 32 rental prices are unaffected. The 5100 tumbles to £3,579 in minimum configuration, which includes the integral screen and tape cassette.

A similar 17% cut, to £3,517, is made on the 16K-byte 5110; the larger 64K-byte model is cut by 11%. Both machines are available on purchase only.

Cuts of 17% in the purchase prices of the 5103 120-chips printer, 5108 tape unit and 5114 floppy disc drive have also been made.

Datey leads rescue of Regnecentralen

THE crisis at Regnecentralen, Denmark's national computer manufacturer, seems close to resolution following commitments from major customers to continue buying the company's equipment, and discussions of possible financial support.

Last week, it was announced that following an unexpected loss from a subsidiary, all the company's employees had been given notice (CW, May 3).

Leading the list of major companies determined to ensure that Regnecentralen remains in business is Datey, the big German service bureau for tax consultants and accountants. Datey has almost completed installation of a comprehensive network of RC3600 remote terminal systems.

"Datey has expressed interest in some kind of participation in the restructuring of Regnecentralen," John Kimmel, marketing director for Germany and Holland, told Computer Weekly.

"This does not necessarily mean financial participation; we may be able to finance continued production from our own resources."

"We have been carrying out a

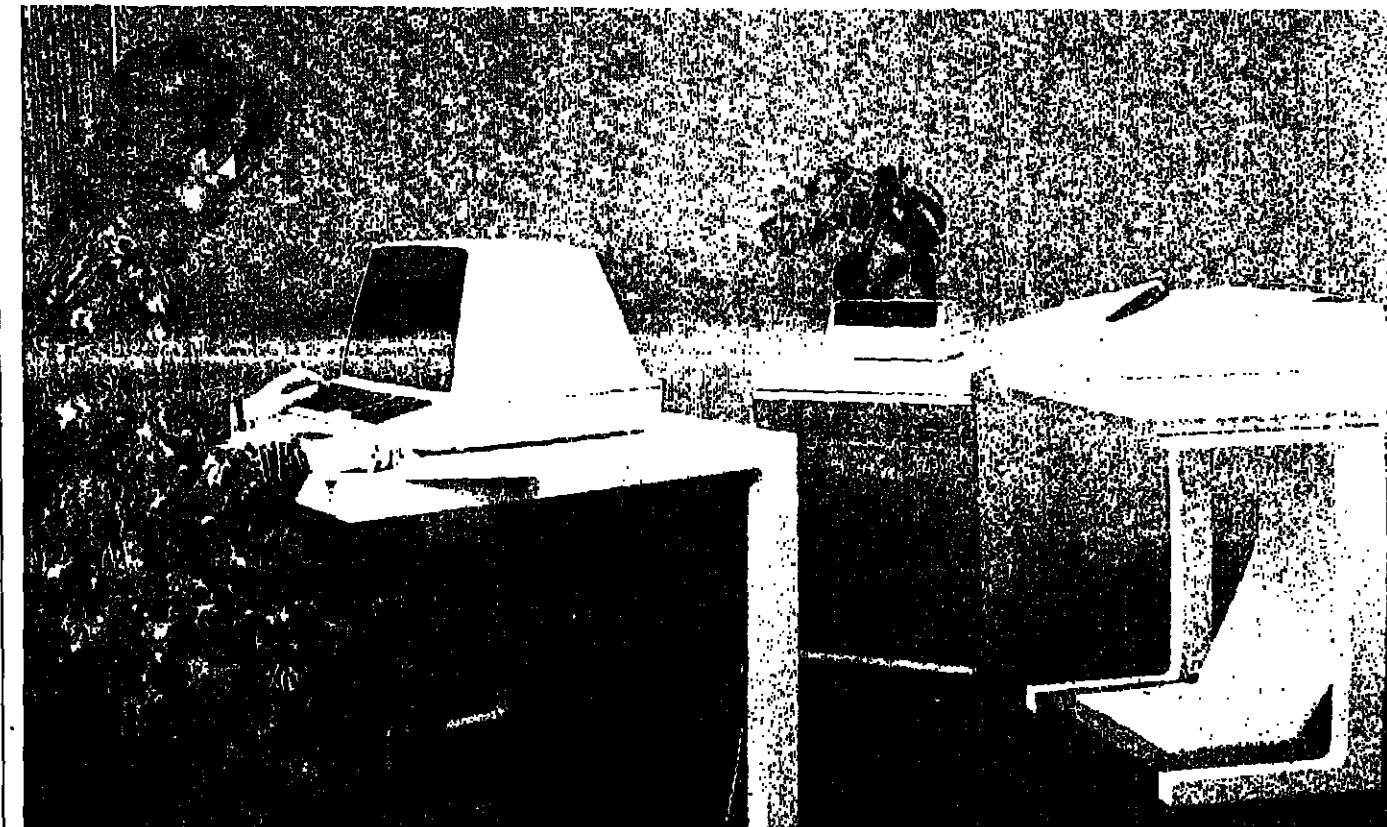
major market study in each of the countries where we operate, and we have been surprised at the strength of the market for our products, particularly the communications products like the RC3600."

In the US, Lockheed is marketing a database system based on the RC3000 24-bit computer which is used for answering telephone inquiries.

"We have been having talks with Lockheed and they want to continue marketing the product," said Kimmel. "A large Dutch service bureau is also interested in participation, and the commitment of these large companies to continue buying our products is very encouraging and helpful."

The three main arms of Regnecentralen's business are a major chain of bureaux in Denmark, and manufacture and marketing of the RC3000 and the RC3600.

A major Regnecentralen customer in the UK is the European Centre for Medium Range Weather Forecasting at Shinfield Park, which is establishing an international star network.



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Dottime

Cosy number for linguists

WE in the computer business are often accused of trying to turn everything in the world into numbers. Well, now I can reveal that we are not the only culprits. A civil engineer I know who works for Ove Arup let slip to me that the conversation around her office consists almost entirely of numbers these days.

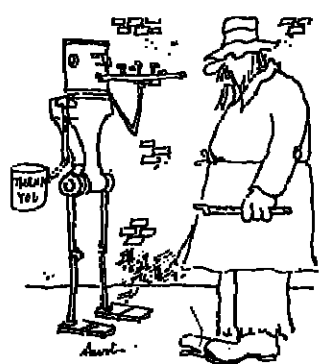
It seems some time ago they realised they were talking largely in clichés, and so to simplify things they drew up a list and gave them all numbers. It is surprising how few phrases will do to suit most occasions. For example:

(1) Oh my God! (2) Pass. (3) Don't give me that! (4) That's true, that's very true. (5) Pas de problème. (6) Do be awfully careful. (7) Over the top! (8) PDQ (Pretty damn quick). (9) I'm pretty laid back about this.

Lots of offices develop their own private language, of course. Has yours? In a lab where I once worked, the inevitable answer to the question "How do you do such and such?" was "With considerable difficulty."

At MIT a few years back people would talk in numbers quite naturally. (For all I know, they still do.) You would hear people say "I'm going down to 50-340 at 10:30 to do a 6.41 run on the 7094," and it would sound perfectly normal.

(Let me translate for the uninitiated, 50-340 is a building and room number. 6.41 is a course in the Electrical Engineering department (6): "Introduction to



"When I hit bottom, I thought that at least I'll never be squeezed out by automation."

Electronic Computers". If you don't know what a 7094 is, your youth is showing.)

One undergraduate got someone to send him a letter with nothing on the envelope apart from two numbers: his student registration number and the post code thus:

631470

02139

and he got it! Apparently it arrived at the Cambridge, Mass. post office where they said, "Oh, some clown at MIT," and sent it round.

Favourite number?

TALKING of numbers, it seems the computer world is fast running out of them — but when it gets hold of a good one, it just won't let it go. In perhaps unconscious obedience to Britain's most successful and beloved computer line yet, new 1900s are bursting out all over.

The Storage Technology 1900 is a series of rack mounted tape drives, while Klenzle has chosen the name for its new low-cost office computer. And then there's the Olivetti 1900, better known among the cognoscenti as the Microdata Express. I'm calling my new TP monitor George.

Our boat was a spanking new

Unacceptable face of DP

AS others see us: Recently, the Guardian's cartoon strip on the Women's Page, "The Silent Three", quoted a young lady thus:

"You know, I met a bloke the other day, who was really quite O.K. ... Well ... he wasn't much cop ... computer systems analyst ... rather weedy looking ... a very ordinary bloke."

Oh, well, back to finding another career. I suppose we could try being airline pilots, or oil company executives, or international jewel thieves. Mind you, somebody in a pub once told me I looked like a chartered accountant. Is that better or worse than being a weedy-looking systems analyst?

Life on the ocean wave...

...in which our intrepid

Rory Johnston becomes an

Informatician

YACHT racing has been compared to standing under a cold shower tearing up five pound notes. Having taken part in the second Coupe de l'Informatique, the French computer industry's four-day race around the Gulf of St Malo, I can confirm that when the wind is howling away at 30 knots, and the raft is pelting down, and you have your legs dangling over the weather rail with seas breaking over you, you are sorely tempted to agree with this view.

The race was organised by AFIN, the French equivalent of the BCS, and taking part were 48 yachts sponsored by a wide range of firms such as Logabax, Cisl, CGS, and Europe Informatique, as well as such well-known French companies as Control Data, Digital Equipment, ITT, and Data General.

Representing the Rest of the World's computer industry was one crew consisting of three old salts from Manchester-based software house Master Resources, a sail-maker friend of theirs, and yours truly, hastily appointed Computer Weekly's yachting correspondent.

Our boat was a spanking new

28-foot sloop called Oxygene, with a French skipper. This caused us some trepidation beforehand. "What on earth is the French for 'clew outhaul'?" we wondered. In the event the skipper spoke English but several times he forgot it in the heat of the moment and would point frantically, shouting "Pool ze zing! Ze zing under ze boom!"

Despite this we didn't do badly, avoiding the blunders of several crews who merrily sailed the wrong way round buoys, and so on.

The first day's leg, from St Malo to Jersey, was the most frantic: A reach with winds varying from 15 to 30 knots, reefs going in and out all the time, and your reporter feeling distinctly green about the gills. "Why don't you steer around the

bumps, Glyn?" was a frequent complaint to the helmsman, who replied that at least he was staying out of the holes.

The second day's run to Granville from Jersey, with the wind aft and the spinnaker up, was a lot more tranquil, but still the sun refused adamantly to shine. The third day's racing was called off, owing to forecasts of force eight gales and "mer agitée," but as luck would have it the sun shone for our sightseeing in Granville.

The final leg back to St Malo was close-hauled with plenty of wind and rain, prompting someone to say, "You know, there are people who wouldn't understand that this is pleasant." In the final results, I can assure you that the Rest of the World was not disgraced, as we came 14th out of 31 boats in our

unmeasured (not handicapped) class, Sita coming first.

Control Data was winner of the measured class, beating the real star of the race, a huge, beautiful former America's Cup contender named Aquitaine, entered by CII-HB.

Despite not placing, we were generously presented with a special prize for having defended the Rest of the World's honour — a medal and certificates conferring on us the title of "Informaticians."

Master Resources is thinking seriously of organising a British equivalent race for next year, and would like to hear from anyone in the industry who would be interested. Contact Noel McLean at Langley House, Staneylands Road, Wilmshurst, Cheshire SK9 4HA. Tel 05664 32127.

Amdahl impacts big systems

From front page

sophistication, which means that support costs are likely to be less than for mid-range manufacturers, and the easy identification of potential customers, which gave the company a formidable return of \$4 million per salesman in 1978.

The principal threat on the Amdahl horizon is the forthcoming IBM 303X replacement line, the H-series. But even this could well work in Amdahl's favour, according to the report.

Although some observers expect the first H-series models to make their debut this autumn for delivery in late 1980, Paine Webber believes that IBM may still be under-estimating the demand for its latest products. If so, a bigger than expected backlog for 4300s would inevitably delay the introduction of the H-series, giving Amdahl more

breathing space to develop its next generation. The long delays on the 303X machines actually boosted Amdahl's business since it could offer better delivery dates. Meanwhile they forecast an Amdahl 470V/9 before the end of the year.

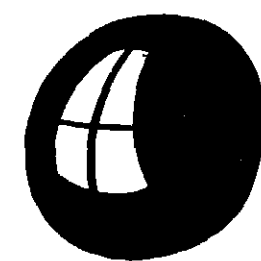
In the mid-range of the mainframe market, Paine Webber sees a tough time for all IBM's competitors, both compatible and non-compatible. Manufacturers like Magnuson, Citel and Nanodata are still in the start-up phase, and may well find it difficult to raise more capital following the 4300 launch. Meanwhile now that it is so cheap and straightforward to design a machine to run almost anyone's system software, the traditional mainframes like Burroughs, Honeywell and ICL are likely to come under PCM attack.

Paine Webber believes that an inexorable shift towards IBM-compatible software throughout the industry is under way — which echoes the view of Gene Amdahl (CW, December 8, 1977). They forecast that by 1983, the combined value of installed IBM-compatible CPUs in the middle and large mainframe market will have overtaken that of the installed bases of every other manufacturer, estimating IBM's share at 64%, that of the PCMs at 11%, and that of Honeywell, at present the world number two, at about 15%.

Only Burroughs and "others" (presumably ICL, Siemens, Nippon Electric) are forecast to increase their share from its present level. They cite the 370 emulation

facility which Univac offers on the 90/80 as a pointer to what other manufacturers will have to do, and in this context, it will be interesting to see whether Univac incorporates IBM compatibility right through the line it is preparing to announce at the NCC as the 90-series successor (CW, March 15).

At the bottom end of the mainframe market, they see a problematical future for the minimakers, with four PCMs in particular causing trouble. The four are Two PL National Semiconductor with the System 400, Cambridge Memories with three unannounced machines, and Interdata with the Kardios 370 and 7/32 emulators on the 7/32 and 8/32 minis.



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Brewers to market vehicle software

A VEHICLE maintenance system, developed by Allied Breweries for its own use, is to be marketed by the company both as a package and in the form of a bureau service.

Called Abcas, the software provides regular detailed information on the running of each vehicle and is said to be applicable to any fleet operator maintaining more than 50 vehicles.

Among information provided is the type and frequency of any repairs; fuel consumption; and details of servicing. A key section is an exception report highlighting such things as servicing irregularities.

Abcas is said to have saved Allied £8,000 a year when applied to its fleet of 5,000 vehicles, and will be sold for in-house use for £10,000. Alternatively, Allied will run the software as a complete service for clients at a cost of 90p per vehicle per month.

GILB'S MYTHODOLOGY

Data collection forms pollute DP systems



COMPUTER input data collection forms are so common and traditional as to be above question. We force various innocent people to fill in these forms, and thus make them accomplices in the pollution of our own data processing systems.

It is commonly believed that the forms somehow add speed of processing and reliability to the data collection and data entry process.

I should like to argue that this is no longer true. It may have been true, some decades ago. It may even be true in limited instances today. But in a large number of cases where we are using a form, we are really misusing it, and doing

our own reputation a disservice.

The main difference is that the cost and practicality of automating the functions of a form have vastly improved in favour of the computer.

First, practically. What is a data entry form? I have managed to identify in my own mind three main functions of the form. To instruct us as to a particular sequence of input data. To instruct us as to a particular format. To instruct us as to what constitutes a complete set of input data elements.

In short, the form is a program for people. I suggest that all these functions can and should be automated. They can

be automated by getting those who fill in the forms to key in natural data formats, in the natural sequence in which they occur, and to get the computer to remind people, sooner or later, about the missing needed data elements.

In one sense, we are talking about an automated form, and a "smart" form. We are also talking about the elimination of a whole traditional work process, of filling in paper forms. We shall have to spend much more effort in the design of such systems. Many present forms reflect on a lack of serious design effort. And we shall have to write more sophisticated programs to handle the intelligent form.

I know the mere thought of writing more program code has the effect of scaring programmers into using the traditional data entry form. To save an hour of programming once, some would gladly spend several work-years of the office staff's time.

But we must pluck up our professional courage and make more use of the tools which fate has so generously placed in our hands: the ability to design programs and the machines to execute them.

The form functions should be automated because it will normally result in a faster processing of data from source to correct machine readable format. They should be

automated because computers are more reliable than humans at such work. They should be automated because computers are cheaper. In most countries, the microcomputer technology gives a strong impetus to this kind of change.

The art of designing away the form is not very difficult, but few of our designers have received any training to do it. Very few have clear motivation from their environment to attempt it. It is not traditional, and tradition is stronger than common sense. Once designers are motivated and trained, it is really a simple process of automating the work previously done by humans in looking up codes, converting date and amount concepts to standard digital formats, and identifying the meaning of natural data elements. One of the tools which make possible the elimination, or at least the strong simplification

and modernisation of the traditional form, is the possibility of access to a database during the data collection process. The possibility of interactive dialogue and instruction from cheap microprocessors, perhaps coupled with equally cheap secondary storage for programs, files and instructions, adds substantially to the viability of form elimination.

But it would be a mistake to presume that database technology, microcomputers or interactive capability are necessary prerequisites for the elimination of the form. It can be accomplished to a large measure without these tools. Lack of them should not be an excuse for not trying to automate the forms function to a greater degree.

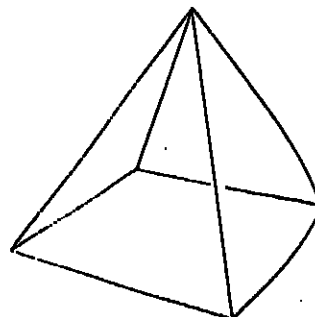
Ask yourself the following questions:

1. Could we benefit substantially if our forms were reduced, simplified or eliminated?
2. Have we taken steps to ensure that our designers (called analysts and programmers at times) really do know about and master the techniques for automating the form functions?
3. Does management set specific goals for our projects products related to human productivity in data capture which will force us to make use of such technologies wherever they are viable? Have we made it clear to management that an investment in this area of automation will pay dividends in terms of productivity, accuracy and speed of data capture?

Puzzler

THE square-based pyramid (right) has five vertices and eight edges. Can you label each edge with a different number from 1 to 10, in such a way that the sum of the edges meeting at each vertex is a constant of 18? There is only one way to do this, not counting rotations and reflections.

See page 43 for solution.



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SOFTWARE FILE

Informatics' distributed DP support for PDP-11s

HAVING discreetly amassed a worldwide user base of 60 for its PDP-11 product Series IV, Informatics has revealed that the software now provides comprehensive support for distributed processing on minicomputer networks.

This it does with a sophisticated set of tools enabling even end-users to build linked interactive applications in an environment also including RSX-11M and DECnet.

As an illustration of the power of the system, Informatics cites one user who built a complete cargo loading and tracking application using Series IV facilities alone.

Although initially restricted to the PDP-11, the software may later be adapted to other minicomputers.

Series IV was originally announced 18 months ago as a data entry validation package for the PDP-11 (Software File, September 29, 1977). A key feature was the ability to implement a complete data entry application using a parameter language,

without any conventional programming.

With release 5, data validation and entry (DVE) has become just one of three components of the package, which also includes a transaction processing system (Series IV/TPS) and software for distributed data processing (Series IV/DDP).

Required on each minicomputer in the network, DDP appears to provide many of the same functions as IBM's S/300 software, catering in effect for strict centralised control over a distributed application network.

When linked with Series IV/TPS, it allows applications to communicate not only with each other but also with IBM mainframes. Both 2780 and 3271 protocols are currently supported and central files can be updated on a daily, hourly, or online basis.

TPS itself is described by the company as "much more than a TP monitor" and is said to "facilitate local development and implementation of screen-oriented applications".

It supports up to 32 terminals, all of which can be running different applications, and its constituent real-time executive is also an integral component of DVE.

Because all the Series IV products run under RSX-11M, applications built with them can be freely interfaced with existing or conventionally-developed applications. There is also an interface to the Total DBMS.

However Informatics sees most PDP-11s as already fully loaded and expects most purchasers to install new hardware at the same time. Indeed it may well go into the business of supplying complete hardware/software systems, probably in conjunction with a systems house.

Since Series IV first appeared, it notes, the launch of the LSI-11

has halved the minimum hardware cost and a complete system could be bought for as little as £25,000.

Prices of the software alone are around £15,000 for TPS; £13,500 for DVE; and £7,500 for DDP. DVE is included in the price of TPS and quantity discounts are offered on all three components.

Earlier meeting

PRESSURE of work on the Ansi X3J4 Cobol committee during its first meeting in London, has obliged the BCS Cobol specialists group to re-schedule its evening meeting on May 23 from 6.30 to 8.00 pm.

George Baird, manager of the US Federal Compiler Testing Centre, is to give a progress report on Cobol compiler validation. The meeting will be at the Clifton Hotel, Woburn, Bedfordshire.

Prices, release dates for Cincom's TIS

CINCOM fleshed out its plans for TIS by announcing prices and release dates at its eighth international user conference, held in London.

Attended by over 250 of Cincom's 450 direct European customers, the meeting included the first European presentation of TIS, which was launched by the company in the US last year.

Release 0, it was disclosed, has been in beta test at US sites for some months now, including Johns Mansville and the Orange Coast Community College. Cincom is to begin installing release 1 this month in the US, and will make the software available to selected European customers at about the end of this year.

This release will be restricted to OS and Environ/1 users and will include the directory; batch and online query facilities; TIS comprehensive retrieval; communications management and communications monitor. It will be available on un-

limited release — referred to by the company as "absolute general release" — around the middle of next year. TIS Query — the successor to T-ask (Software File, June 15, 1978) — will then be available in French and German versions in addition to English.

Meanwhile release 2, which will include all announced TIS facilities with the exception of the update preprocessor, should make its debut around spring 1980, and will be available in Europe about six months later.

Only two prices have so far been mentioned by Cincom. The minimum purchase giving basic batch DBMS facilities and the directory will cost about £50,000. The complete product will cost about £140,000.

For its first customers, Cincom will be looking to experienced Total users already skilled in data resource management and probably making full use of the data dictionary.

PROGRAMMER NOTES

Raising productivity with report generators

PROGRAMMER NOTES has in recent weeks argued that program generators could have an increasing role in improving productivity. Another option open to the hard-pressed DP department is the use of a non-procedural report generator package.

Packages of this type have been available for some years, well-known examples including CA-Earl, Mark IV, Easytrieve, and Quik-job. Depending on DP policies and the usability of the software, they may be made available either to DP staff or to end-users, or to both.

However the traditional mistrust of new higher-level tools — particularly the suspicion that they may be too restrictive or inefficient — has to some extent held back their acceptance.

In the light of the productivity crisis, though, an increasing number of installations will find some such tool essential. So it was interesting to receive a summary of an evaluation exercise recently carried out by one — anonymous — company.

Carried out prior to installing Pansophic's Easytrieve, the main purpose was to obtain

some form of comparison between Easytrieve and Cobol. Two secondary objectives were to determine the potential scope for Easytrieve applications and to see how quickly it could be learnt.

Three user departments were selected at random and asked to provide details of reports which they could not currently obtain, but which would prove useful if they could be supplied at relatively short notice.

In each test case selected, the team studied factors including coding time; number of source statements; source code and JCL preparation time; testing and debugging time; and learning.

What appears to emerge from the limited information provided is that while dramatic savings are possible for simple jobs, for more complex jobs the savings are rather less impressive.

One job, for example, that took 332 Cobol statements was accomplished using Easytrieve in 9. The total time taken with Cobol was 8 hours 45 minutes as opposed to just 58 minutes with Easytrieve. Much of this saving was achieved in code preparation and verification, which took 3 hours 40 minutes for the Cobol and only 4 minutes for Easytrieve.

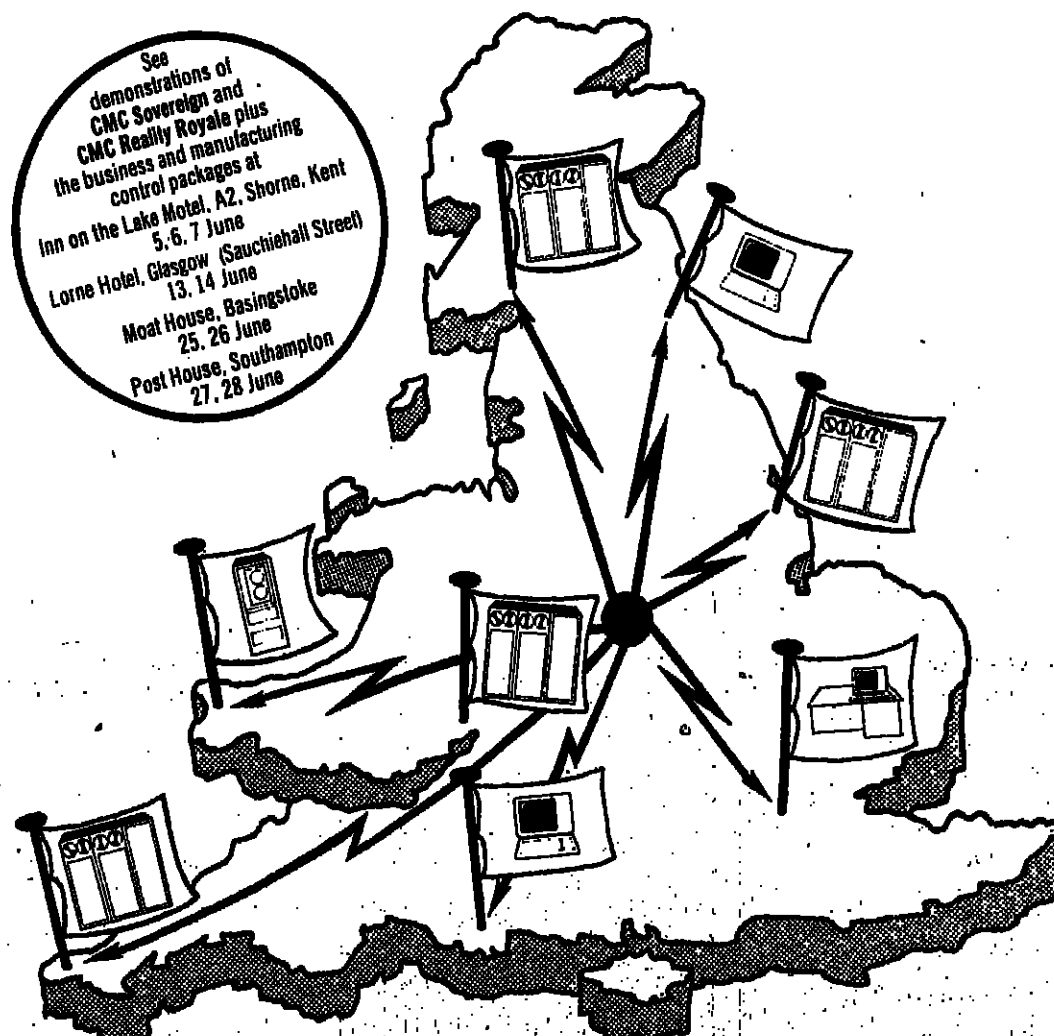
However in the case of a more complex report, a 352-statement Cobol program was replaced by as many as 140 statements in Easytrieve. The respective development times were 7 hours 25 minutes using the former and 3 hours 9 minutes using the latter.

While the summary available permits no deeper analysis, the discrepancy probably reflects the fact that all report generators have distinctive strengths and weaknesses. Not every processing job will be handled easily by a particular generator, and some may not be amenable to any generator.

The moral, therefore, is to choose one, if possible, whose capabilities are best matched to one's own habitual retrieval needs.

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OP SPOT

Opcomm's ex-chairman breaking new ground

RUSS BEVAN, former chairman of the now disbanded operators' group, Opcomm, has left the Coventry installation of Rolls-Royce, and is now employed in the management services division of Rank Hovis MacDougall as a facilities manager, a position on a par with that of operations manager.

Bevan is currently being trained to take over the running of one of RHM's bakeries, which have ICL 2903s together with

7502 terminals.

After his initial training, Bevan will be involved in relief work — moving about the country, covering RHM site managers who are on holiday or away for other reasons. "As soon as a vacancy comes up, I will get a permanent installation on my own. I'm hoping to get a brand-new site. That would give me the opportunity to get involved in site planning, recruitment, etc."

Rigours of shift work

MANAGEMENT should take more care when deciding upon the shift pattern their operators staff are to work. And operators should be given medicals regularly — every three or six months.

I write this after talking to an operator who gave up shift work on the advice of his doctor who described him as being in a state of "permanent jet lag".

The "Continental" shift pattern he worked involves working two day shifts, followed by two evenings and three on nights. Then comes a two-day break. The next rota consists of three day shifts and the one after that of three evenings.

● Shift work is a very important subject and I would like to hear your views on it.

What ops wear doesn't affect equipment

"I HAVE no knowledge of the equipment used at the 'Ernie' site, but if I were to win I'd accept the way line cheque willingly."

Thus Dave Miller, a shift leader at the Bristol installation of the Imperial Group, responds to a letter on operators and dress from Barry Denyer of Lloyds Bank in Worthing, Sussex.

In essence, Denyer had argued that dress reflects the attitude of the site as a whole. He wrote: "Having a letter from 'Ernie' the

other day containing some Premium Bond winnings, I was absolutely amazed at the way line printing. I would imagine that the operators who produced the document don't hold with the 'collar and tie' idea."

Comments Miller, "His last paragraph left me feeling that he hasn't been operating long, or has been lucky enough not to work with printers similar to the ICL 1933 type where print is produced by a revolving drum."

"We had two at my site for several years, and towards the end of their 'life' we were unable to get anything other than 'way line' print from them regardless of the time we spent setting them up, or the amount of time and trouble the engineers spent on them."

"I think that I can also say quite definitely that the print quality didn't vary when I wore a suit on the day shift, or casual clothes on a late shift."

Inter-shift competition is often counter-productive

ASK an operator to compare the two or three shift teams of his installation and he will almost certainly talk in glowing terms about his own, while pointing to the shortcomings of the others.

Ask for details, and he will mention how good his colleagues, particularly his senior colleagues, are from a technical viewpoint, and say that they always do the work more quickly and efficiently than the others.

Now some might consider that such loyalty, and the competition that often exists between shifts as a result of it, is good — but I am inclined to disagree.

In my view, operations staff should consider the installation as a whole, and both communicate and co-operate with the members of the other shifts.

Relations between shifts are often good at the smaller installation, as instanced by a site where I was once employed as an operator. We worked a two-shift system, with two operators per team.

Both teams would try to get as much work as possible processed during the day, and as a result the evening shift would often end well before the scheduled 11.30 pm finish.

Of course, there was the occasional disagreement, but on the whole both teams worked well together and it was not unusual for one of us to start the evening shift early in order to help out.

But at the larger installation, things aren't quite so good — often there is a complete lack of communication, or it exists only

in the form of bickering.

At one installation I know of, the end-of-shift reports were, and probably still are for that matter, littered with petty little remarks about the printers or card readers not being cleaned properly.

And at handovers, the lack of co-operation between the two sets of operators often resulted in jobs being left on the input and output queues far longer than necessary, and incomplete listings being returned to the user.

When relations between shifts are poor, the operations manager must involve himself by calling his shift leaders together in order to discuss the matter.

In fact, such meetings should be held every two or three weeks, anyway. And it is a good idea to include one or two operators from each shift so that they can have a say in matters affecting them.

Another way of improving relations is to swap operators between shifts for two weeks or so.

HINT OF THE WEEK

Adding comments to the hardcopy log under IBM OS

THIS week, the hardcopy log is the subject of a hint from Colin O'Keefe, assistant operations officer at British Airways in London. He explains how to add comments to IBM OS commands.

He writes, "This is very useful for the operator when he takes over the console from one of his colleagues. By looking at the hardcopy log he can, for example, find out why a job was cancelled or why a certain tape drive was taken out of operation."

According to O'Keefe, this is achieved quite simply by tagging the comment on the end of the command when typing it in at the console. Both command and comment are then routed to the hardcopy log by the system.

He gives an example: C XYZTST, DUMP, TRYING TO FIX HANG

From this the operator can tell that the job called XYZTST was cancelled in an attempt to clear a system hang.

Microcomputers and Mainframes

Microcomputers are finding a place in data processing, both as stand-alone alternatives and as enhancements to existing data processing departments. Do you know their place in your organisation?

'Microcomputers in data processing' is a one-day seminar and exhibition being held on 12 June at The Grand Hotel, Birmingham.

Seminar Bookings, stating name of delegate and enclosing cheque for £78.84 inc VAT (NCC Members £70.96) to: Joan Seth 810 The National Computing Centre Oxford Road, Manchester M1 7ED Telephone 061-228 8333

NCC seminar

WP user group to stimulate training

A NEW word processing user group is to try to stimulate increased education and training in the operational and management skills needed to exploit computer-based office information systems.

There is currently an acute shortage of word processing operators, and the public and private educational community is failing to meet the growing demand, according to Hugh Channon of Arthur Andersen & Co, chairman of the user group, the UK branch of the US-based International Word Processing Association.

The president of the IWP, Erv Steadman, who was in London last week to inaugurate the first IWP branch outside North America, said that there was also a shortage of word processing staff in the US, but over 25% of further education colleges offered certificates in word processing and about 25% of secretarial courses up to high school level offered introductions to the concepts of the new technology.

Many of these courses had come about through the active participation of IWP members in "citizen advisory councils" which exist in some areas of the US to liaise between industry and the educational system.

Steadman claimed that word processing had also opened up new career opportunities in management and supervisory functions for secretarial and clerical staff.

The UK branch is the 54th in the IWP, which has approaching 7,000 members in the US and Canada and which expects to

open an Australian branch soon.

Hugh Chapman said that there was an urgent need for users in the UK to have a body which represents their needs, provides an exchange of experience between those implementing and planning to implement word processing equipment and provides a link between users and suppliers of systems and services.

By becoming a branch of the IWP, Chapman said that the new group could immediately draw on the wide range of facilities offered by its parent body, which has been in existence since 1973, first as a group of the US Administrative Management Society and since 1977 as an independent, non-profit making organisation.

IBM opens French boutique

HOT on the heels of its Rotterdam retail centre (CW May 3), IBM's General Systems Division has opened a GSD shop in Charbonnières, near Lyons, in France.

Chicly styled the IBM Boutique, the store is the first of three planned for France this year; the others will be in Paris and Lille, and a total of 21 are planned for Europe this year. Main product to be promoted is the IBM 5110 desk-top computer, and the customers aimed at are small and medium-sized companies. The stores will take orders for the machines rather than sell them over the counter.

AMDahl sales for the quarter ended on March 30, were \$87.5 million producing a pre-tax profit of \$24.5 million. Figures for the same period in 1978 were \$83.7 million and \$19.1 million respectively. The selling prices for the company's computer systems were reduced by about 20% during these two years.

HONEYWELL sales for the first quarter of 1979 were \$866.8 million compared with \$788.8 million in the first quarter of 1978. Profits after tax for these periods were \$58.6 million and \$35.4 million respectively.

NATIONAL CSS sales for the 13 weeks ending February 28 were \$23.2 million compared with \$13 million for the same period in

1978. Profit before tax increased from \$2.04 million to \$2.38 million for these comparable 13-week periods.

DATA GENERAL sales for the 12-week period ending March 17 were \$112.4 million compared with \$81.6 million for the same period in 1978. Profits after tax for these periods were \$12.2 million and \$8.5 million respectively.

PRIME COMPUTER sales for the 13 weeks ending April 1 were \$29.5 million compared with \$18.1 million for the corresponding period in 1978. Profits after tax for these comparable quarters were \$2.9 million and \$1.6 million respectively.

BURROUGHS reports, for the first quarter of 1979, sales of \$588 million compared with \$505 million for the same period in 1978. Analysis of these periods' sales shows an increase in rental and

service revenue of 15%, and 18% increase in sales of products and systems. Aggregate profits after tax were \$42.2 million for the first quarter in 1979 and \$33.5 million for the comparable period in 1978.

STORAGE TECHNOLOGY reports sales of \$69.9 million for the 13 weeks up to March 30, with pre-tax profits of \$13.24 million. For the same period in 1978 sales were \$37.3 million earning pre-tax profits of \$6.57 million.

DATUM INC reports sales for the 13 weeks ended March 31 of \$3.6 million. This was below the comparable figure for 1978 of \$4.1 million. Profit before tax dropped from \$341,000 to \$86,000 for these comparable periods. The reasons given for the fall in sales and profits were increases in development expenditure and new product development.



USERS of ICL equipment throughout the world want to establish direct links with the company so that their needs can be dealt with more quickly. This was one of the points that came out of the first full meeting of the International Federation of ICL Computer Users Associations, held in Jersey.

The delegates felt that working through local ICL representatives resulted in slow and unreliable communication with the company in the UK. Next month the federation hopes to have a special meeting, most likely in Paris, when Lee Cole, ICL's director of worldwide marketing, will meet the delegates to discuss the development of company communication.

At the Jersey meeting it was decided to hold a full conference at least once a year. The federation was set up in 1977 by a group of overseas users who visited the UK CUA conference

at Scarborough. Last year at Eastbourne, the federation held a half-day meeting at the end of the UK conference.

The next full conference of the federation will be in May next year, although European members are thinking of having an intermediate conference this autumn.

UK representatives at the Jersey conference included Howard Wrigley, former chairman of the UK CUA, who is president of the federation, and the CUA chairman and vice-chairman, Jim Rothwell and Stuart Gould.

US users were represented by Frank Miles, a System Ten user, who is vice-president of Forum International, the group that covers users of Singer, TRW and ICL kit in the US.

● Or picture shows a line-up of the delegates at the Jersey meeting.

Decision on services to US

GRAPHNET and Telenet in the US are to be authorised by the Federal Communications Commission in Washington to offer facsimile and data transmission services respectively to Europe.

Authorisation was given in 1977 for a service in the out-bound direction only, but permission for the inbound direction was withheld because Western Union International objected to its monopoly of international telegraphy being broken. The FCC ruled that the introduction of competition to domestic telegraphy had removed it, but WUI disagreed.

Objections from the other international record carriers, ITT and RCA, were removed when they went into partnership with Graphnet and Telenet. The latest decision on the case has come from the US Court of Appeals for the District of Columbia which has granted the new services a stay pending litigation.

If there's going to be a mess on the line Analysis II will spot it



The picture above shows that lines of communication are not always trouble-free. Data travelling along telephone lines is just as likely to run into difficulty.

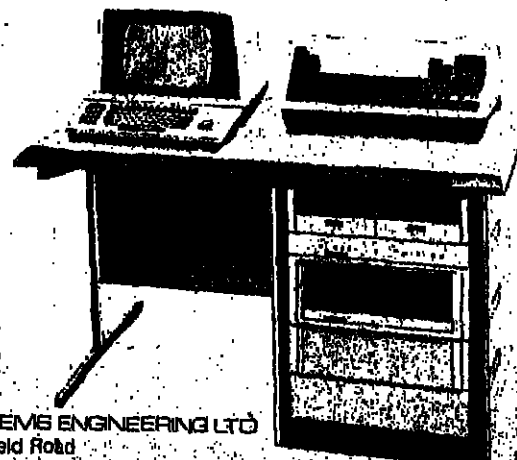
That's where Analysis II comes in. The network control system watches over the line, the modems and the terminals — to

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Beginners in micros

IF you know little about microcomputers and are doing nothing on Saturday, May 12, the specialist magazine Personal Computer World may provide salvation. On that day it is holding a beginners' seminar at the West Centre Hotel, Little Road, London SW6.

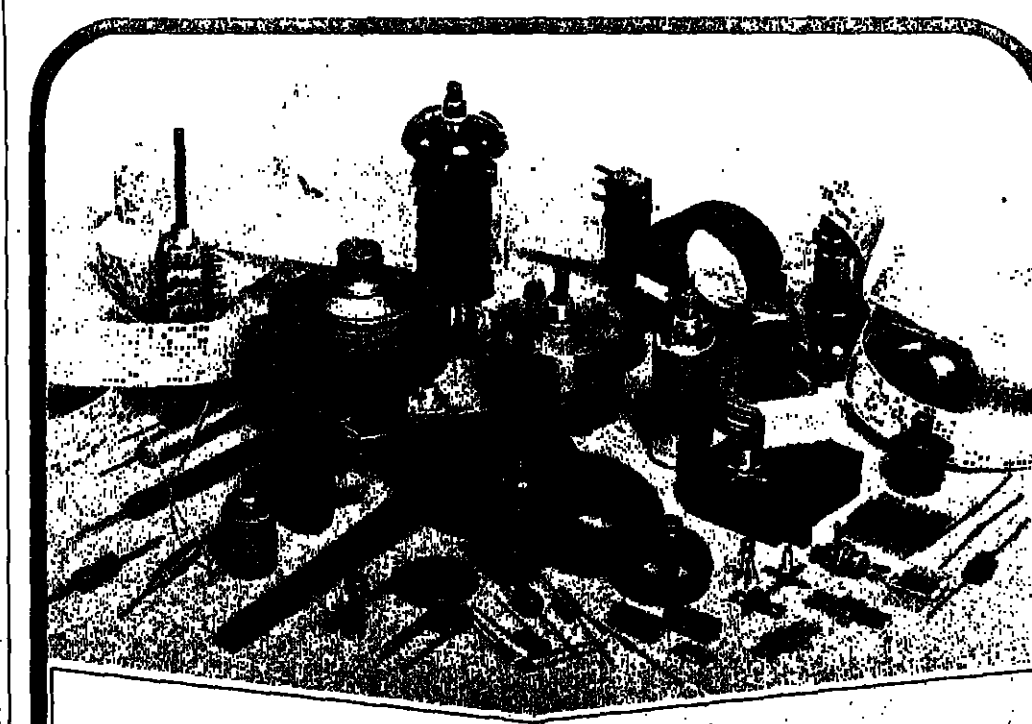
For a fee of £12 per head, the magazine will be presenting author Rodney Zaks, who will cover such topics as hardware, software, business computing, and selecting a system. To complement the event, there will also be a "miniature" exhibition.

Texas adds to 700 series

ADOPTING its own TMS 9800 16-bit microprocessor, Texas Instruments has introduced a highly intelligent terminal into its 700 series. Called the T1771, it went on show in Europe for the first time at Hannover Fair.

It comes with 64K-bytes of main memory, and is offered with a dual floppy disc drive, each with a capacity of 256K-bytes.

Other optional attachments are a 30 cps thermal printer and a 150 cps matrix printer, and Texas believes this product will be attractive as the basis of a stand-alone word processor as well as a traditional terminal.



invite you to see their display of electrovacuum devices—semi-conductor instruments integrated circuits—capacitors—resistors—ferrites, etc.

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PEOPLE AND EVENTS

Professor on IBM board

PRINCIPAL of the London Business School, Professor James Ball, has been appointed a director of IBM UK Holdings and IBM UK. He has been at the school since 1965 when he became professor of economics. As well as his academic work, Prof Ball is currently director of Tube Investments, Barclays Bank Trust, and the Legal and General Assurance Society. He is a governor of the National Institute of Economic and Social Research, a fellow of the British Institute of Management and was chairman of the Committee on Policy Optimisation.



Ball



Neale



McKenzie



Cuzner

Tony Neale has joined the Data Communications Division of Harris Systems as a sales representative, responsible for the company's 8000, 1800 range of computer terminals. He was formerly a salesman with Computer Ancillaries.

Ron McKenzie has joined Compaq as a systems programmer on Celtic, their package for designing integrated circuits. He was previously with Cambridge Consultants, where he worked on projects using the Intel 8080 and PDP-11.

Fellowship for Cuzner

AN IBM fellowship has been awarded to David E. Cuzner, director of IBM UK's development laboratory at Hursley. The fellowship, first made in 1983, goes to IBM scientists, programmers and engineers who have an outstanding record of technical achievement.

Cuzner was the second UK employee to receive the award, for his contribution in the development of low-cost files. He is co-inventor of the swinging arm actuator which has increased the reliability of small disc files.

Shops, Smedley-HP Order Processing System, has won the Imperial group competition for the system which uses computers most beneficially. The competition was launched last year by Malcolm Anson, deputy chairman of the group, and he judged the entries together with David Firth of the NCC and Jim McKinnin, finance director. The winning system ensures that all the day's orders from over 100 salesmen and managers are received and processed on the same day. This is done by each salesman having a portable data entry terminal linked to an audio response microcomputer, which in turn is linked to an ICL mainframe.

Colin Powell (right), management services manager of Smedley-HP, is pictured being presented with a specially commissioned trophy at a celebratory party at Imperial House, London. Presenting the prize is Malcolm Anson, who congratulated the team on their "enthusiasm and initiative."

Anthony Costanzo has been appointed director of marketing for Rockwell International's Collins Communications switching systems division. He formerly worked for American Telephone and Telegraph company, where his most recent position was that of manager for product and business planning for industrial switched networks.

Richard Puk has joined Megat Corp as director of software development. Prior to joining Megat Puk was with Sandia Corp Albuquerque, where he developed and introduced an integrated package for the company's computer graphics facilities.

Dean Webster has joined M.U.K. as a systems consultant. Before this post he was with Redi where he was systems support manager in the company's finance branch. At Redi he will be involved in their banking communications and message switching system.

Expansion of MAI UK

MAI United Kingdom, the subsidiary of the US computer manufacturer Management Assistance, has announced two new appointments: the move to new and larger premises. Tony Armstrong joins MAI as general sales manager, responsible for sales of Basic Four products. Bill Scott has become sales support manager. Armstrong is formerly a salesman with M.I.C. Business Machines, and Scott was consultant with Touche Ross. The company's new address is at Blue Arrow House, Chandos Road, London NW10, Tel. 01-858 9731.

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DIARY

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- MAY 15** What is a project manager? - Southern Association of Project Managers, Waldorf Hotel, London WC2, 10.00. Details APMP, 01-720 2182.
- MAY 16** Design and optimisation of job scheduling strategies. I. Milfrank. De Montfort University, Leicester. 10.00. Details I. Milfrank, 0533 444444.
- MAY 17** Role of large computers in the 1980s. Prof. Frank Sumner. ICL, Savoy Place, London WC2 8RQ.
- MAY 18** IBM CDA Local authorities group. Community Hall, Durham, 14.00.
- MAY 19** Microprocessors - the implications for personal management. Southern operational research group. Henley, Henley Staff College, Henley, 10.00. Details Henley, 0494 454.
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Effective and robust communications net

SHOWN installed in a Royal Signals communications vehicle, this microprocessor-based terminal equipment constitutes one node of a management information system designed to help improve the effectiveness of tactical trunk communications networks.

The system, Bruin M18, was developed for the Ministry of Defence by Systems Designers and is specifically intended for use with the Bruin secure radio network operated by the British Army in Germany.

The system addresses the

problem of reducing the volume of communications management and engineering traffic on the network, and uses existing telegraph channels. More communication capacity is thereby released to operational staff, particularly at peak demand times.

The hardware, which includes an electronically shielded Newbury Labs VDU, is particularly robust, conforming to strict MoD physical, electronic, and maintenance requirements. It is now being manufactured at the Farnborough factory of Systems Designers' associate company, Systems Production.

Abacus 'stunt box' based on Intel micro

A UNIVERSAL bi-directional interface for connecting any protocol system to any other protocol system in computer-based hardware has been produced by Abacus Computers.

Colloquially known as a "stunt box", it can be used to connect "anything to anything", according to Abacus managing director, Derek Rowe.

Based on the Intel 8085 microprocessor, the system uses programmable read-only memories to store the relevant information. It is also equipped with sufficient random-access memory to act as a buffer memory, storing up to 240 bytes of data. Read-only and random memory are expandable

up to 12K bytes and 16K bytes respectively, so that in some control applications, the interface can also be used by itself as the control computer system.

A range of standard PROMs will be available for the common interface requirements, such as SDLC, HDLC, IEEE488 and RS232. With these, the system will cost around £250. For special requirements, Abacus will produce specific firmware, and the cost could be as much as £500.

One of its advantages, according to Rowe, is that such essentials as baud rates can be changed dynamically under software control, while the system is running.

Micro club moves

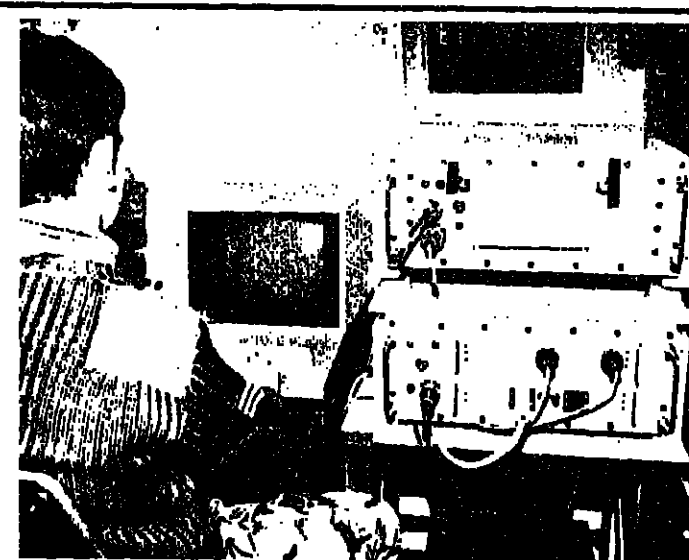
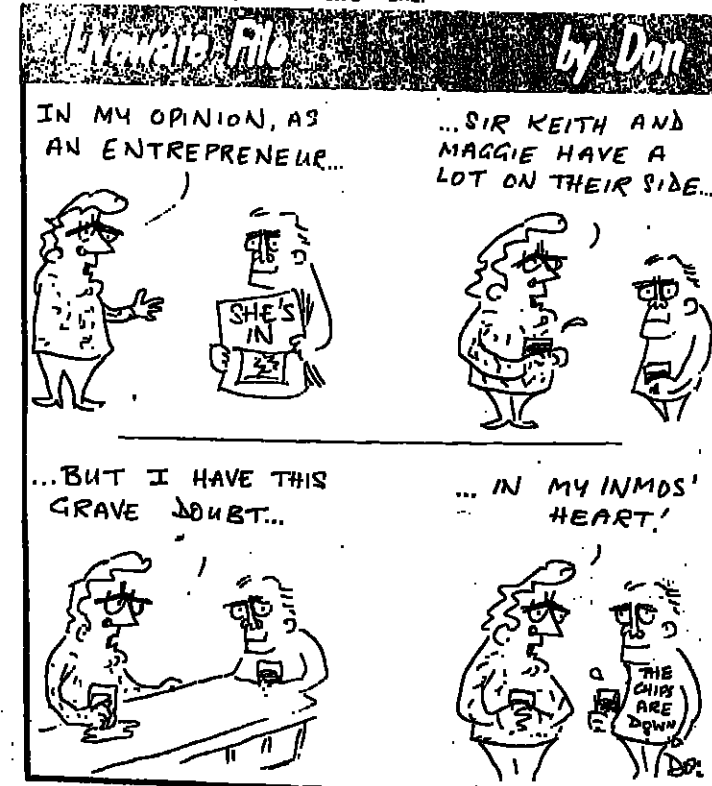
SELMIC, the South-East London Microcomputer Club, has moved its meetings to Thames Polytechnic in Woolwich. Its first meeting there was held last week, when several specialist groups were set up including groups for Nascom users, novices, business users and communications.

Club chairman John Williamson said the move had been made because of Thames Polytechnic's much more co-operative attitude to the provision of facilities, both the

number of rooms available for meetings and support for projects such as outside consultancy activities.

The club's next meeting will be combined with the Grace Hopper lecture on developments in micros, which will be given by Alex d'Agapeyeff of CAP-CPH today, May 10, at Thames Polytechnic main building, Wellington Street, Woolwich, from 4 pm.

Details of the club from John Williamson on 01-585 3281, ext 582.



Two-terminal version of Consort system

DIGICO has introduced a two-terminal version of its low cost Consort system for first time users. Called the Consort 30, a typical configuration would include a 96K byte main memory, two floppy disc drives, a 60 cps matrix printer and two VDUs for £10,500.

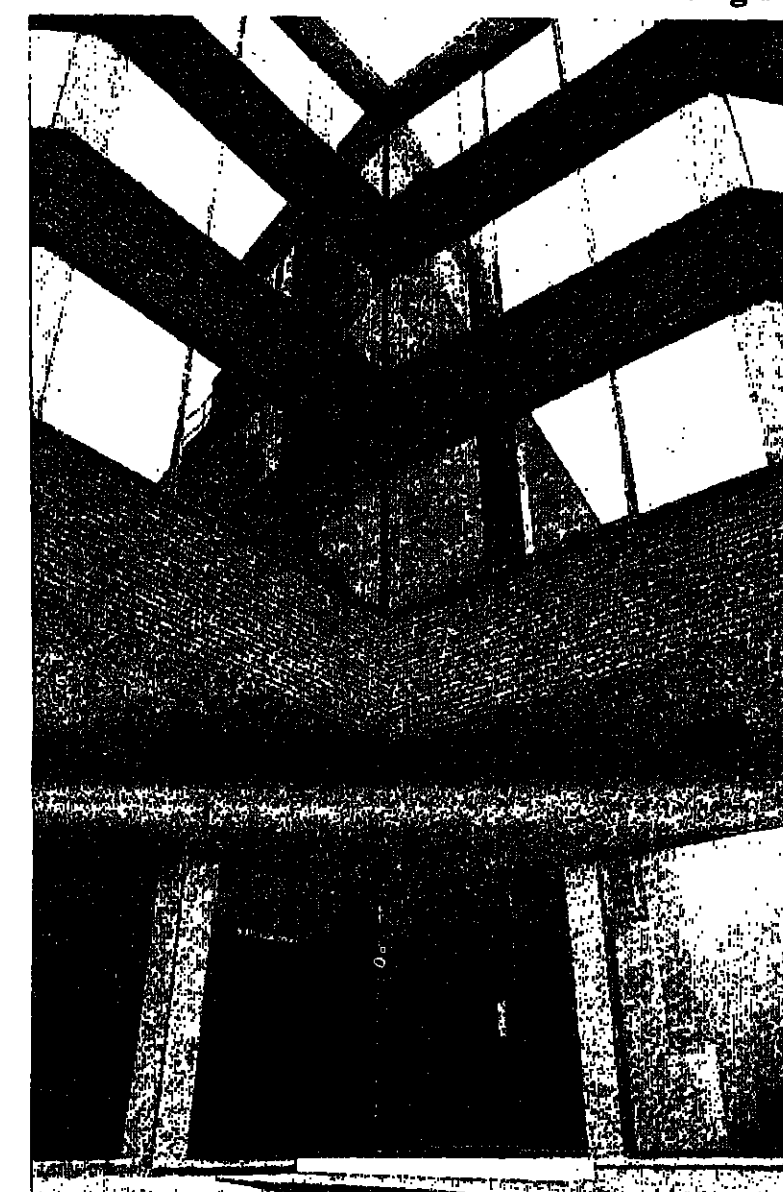
On the software side Consort 30 features include a software version of the hardware paging unit on the MTS/18E, Digico's most powerful 18-bit minicomputer. Like the smaller Consorts the Model 30 comes with a Basic compiler.

The Consort processor has

many of the standard features of the more powerful Digico machines, including multi-level interrupt, direct memory access and a real time clock. It can be field upgraded.

The smaller Consort configurations, the Models 10 and 20, were introduced early last year (CW, February 23, 1978). The Model 30 differs from the new VDU and 48K bytes of main memory, while the Model 10 comes with just one floppy disc drive, a 16K memory and a teletype instead of a VDU and printer.

ATLANTIC is on the move to its own new office building in the city.



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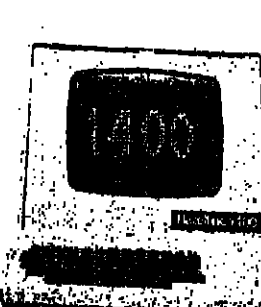
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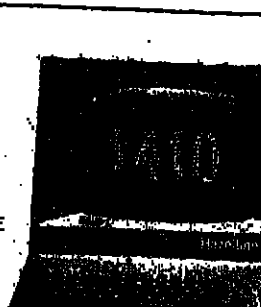


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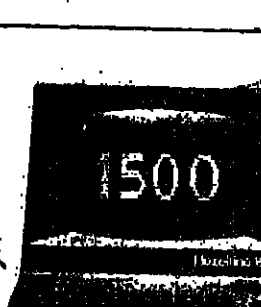
Just Right!
Terminals



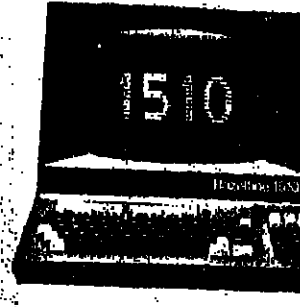
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Features include:
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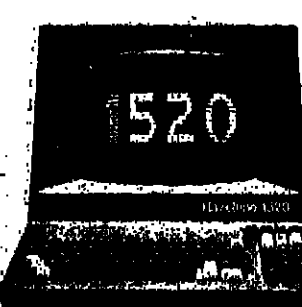
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1400 ECONOMY 1500 STYLE
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* Self test feature (all 1400)
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Plus all the 1400 features



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FULL FEATURED CONVERSATIONAL
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Plus all the 1410 features



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PROTECTED FIELDS LOCAL EDITING
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Tel: 01774 511111. Telex: 227418.
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Management Control Systems Ltd., 10, The Quadrant, London W1 8JL. Tel: 01-729 3445. Telex: 523 121.
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MICRO NEWS

Rapid expansion is under way at the Rockwell International microelectronics division, and imminent announcements include one or more partnerships with European companies.

TIM PALMER reports.

HAVING mastered P-MOS and N-MOS technology, the microelectronics division of Rockwell International is now moving into Silicon-on-Sapphire, SOS, and expects to launch its first product, a low-power very high-speed 16-bit multiplier, later this year. This will be followed by a 16-bit microprocessor late next year (CW, May 3).

So says Malcolm Northrup, who heads the division, and has been touring Europe on a wide-ranging mission which includes assessing the market for board-level modern assemblies and weighing up the attractions of Europe against Mexico and the Far East for a new microelectronics plant.

The other major string to Rockwell's 'bow is bubble memories; the company has

Rockwell moves into SOS and bubble memories

been sampling its 256K-bit device for some time, and a dozen European companies are currently evaluating it.

"We will be sampling our one-Megabit bubble in the fall," says Northrup. "We believe the next step will be four-Megabit devices, but for these we will need to go to the new technologies announced by IBM and Bell Laboratories. We are working along the same lines as they are, but we do not deny that they have a lead."

Bell Laboratories has announced a way of eliminating the electric current coils normally required to generate the magnetic field around the active material, replacing them with a deposit of gold (Micro News, April 12), and IBM has announced a way of encoding the domain walls of the bubbles to

achieve a fourfold improvement in packing density (Micro News, April 28).

Northrup sees bubble memory as a natural replacement for fixed head disc storage, and mentions Electronic Cash Registers, ECRs, as the type of product where they might supplant the floppy disc.

"If you have 1200 ECRs in the field, the maintenance problems posed by a floppy drive on each terminal are enormous, and would justify the extra cost of bubble memories," he comments.

Interestingly, he sees the EEC market as a prime one for bubble memories, noting that while present EEC business accounts for 15% of the division's total, EEC sales of Rockwell's bubble memories could account for 30% of the total on this product.

The biggest single success so far from the Rockwell stable is the four-bit PPS-4/1 micro, which is an enormous seller in the games market.

"The electronic games market is growing at between 30% and 40% a year, and is limited by both the number of chips we can ship and the availability of displays."

Rockwell's eight-bit chip is the PPS-8, and neither has been particularly dominant in the data processing market, although Hindustan Computers in New Delhi has adopted the PPS-8 for a business system, and the PPS-4 for a programmable calculator (CW, June 8, 1978).

Rockwell is also a second source for the MOS Technology 6502, and the company's entry into the 16-bit market, due

shortly, is expected to offer substantial software compatibility with this device (CW, November 30, 1978).

Rockwell Microelectronics at present does 8% of its business with other Rockwell companies, mainly in the defence field, and Northrup anticipates that chips as big as one centimetre square will be needed to handle the ultra-fast signal processing requirements of forthcoming defence applications. It is in part for this market that Rockwell is mastering SOS technology. Northrup sees business with other Rockwell companies growing to 20% within five years.

Visiting firemen invariably face a barrage of questions about the practicability of the National Enterprise Board's Innos microelectronics venture, and Northrup was no exception. "You're talking about that American company in Colorado Springs? I understood that the intention was to aid the UK, and I do not see how siting the first production facility in the US

By Martin Banks



NORTHROP... "We will be sampling our one-Megabit bubble in the fall."

achieves that end. But Innos has some excellent people: well qualified industry leaders.

"The investment in Innos is a significant amount of money, but I doubt whether it is enough to start a major microelectronics company," he warns.

On the link between GEC and Fairchild, he believes that it has more chance of success, provided that the two companies are attuned to each other and can work together.

On the possibility of siting Rockwell's foreign plant in the UK, he acknowledges that the country's industrial relations record is the biggest concern, but does not rule the UK out of consideration on those grounds.

Easing the system design process

BUBBLE memory application with the systems designer very much in mind would seem to be the philosophy behind Intel Magnetic's official entry into the market-place. As predicted, (CW, April 26) the company last week introduced a 1M-bit bubble memory component, together with a set of support circuits specifically aimed at easing the system design process.

The memory is expected by the company to be used initially in micro-based systems applications requiring between 128K bytes and 2Mbytes of storage. In particular, Intel expects to see it being used in terminals, word processing systems, telecommunications and process control.

The prime component in the Intel set is the 7110 bubble memory. This is a serial-parallel shift register device with a binary page organisation. Measuring two square centimetres in area, the device holds 2,048 pages. Each page is 512 bits, which is itself divided into 256 bits, or 64 bytes.

In addition to this main storage area, the device also in-

corporates error correction codes of up to 32 bits per page. There is also up to 192K bits of in-built redundancy in the memory, so that minor defects during fabrication do not necessarily mean rejection of the device at the manufacturing stage.

Its performance specification includes a random access time per page of 40 milliseconds, while the page read and write times require 6.5 milliseconds each.

To some extent, the important products in the Intel chip set at the interfacing components. These are the 7220 bubble memory controller, the 7240 formatter/sense amplifier, the 7230 current pulse generator, and the 7250 coil predriver.

The formatter/sense amplifier is probably the key component in the set after the memory itself. This connects the memory device to the memory controller via a serial bus, so that memory configurations of up to eight bubble memories (1Mbytes of store), each with its attendant formatter/sense amplifier, can be run from one controller.

Abacus takeover bid by anonymous US firm

THE move by a US company to take over Abacus Computers (Micro News, April 5) has been confirmed by managing director Derek Rowe. An offer "well in excess of £100,000" has been made for a 25% stake in the company's equity, plus a capital injection.

This is now being negotiated with the US company, which Rowe declined to name. It is possible that the equity stake could be increased, and that the suitors may also become involved in Rowe's other company, Small Systems Engineering.

The main outcome of the move, according to Rowe, will be a concerted move by the company into the European market. It will also involve the addition of a new, Data

General-based computer system to the company's existing distributorships for Texas Electronic Instruments and Compucolor.

This new machine will be a customised version of the Data General Nova, which will be equipped with 32K by 16-bit words of main memory, plus 10 Mbytes of hard disc storage configured as 5 Mbytes fixed and 5 Mbytes removable.

Known as Dimension Data, the system will be coming direct to Abacus from Data General in the US, and will be marketed by Data General in the UK.

Abacus has also dropped the distributorship of Ohio Scientific, which Rowe says does not now fit the company's market.

CHESSLAB

By DONALD MICHIE

Heuristics v analysis

game. Such a system must proceed by exhaustive analysis. How much blind search must it do?

Black can spin things out for 14 moves (28-ply). At each step White's choices average about 20 legal moves and Black's range from one to five — many more in "stupid" branches of the lookahead in which one or more pawns have been moved in brute-force lookahead such variations must be included. So the total number of variations to be searched is something like 20¹⁴ x 5¹⁴ or 10²⁸. Conclusion: in the absence of heuristics, the position defies analysis.

I recently had the instructive experience of watching the response to this problem of the British program Master, developed at Harwell by Peter Kent and John Birmingham.

When set to search only 5-ply deep, the program soon made a false step and was lost. But when reset to 7-ply it unrolled the solution unerringly. The concepts embedded in its "evaluation function" which it found relevant were the following:

1. Checkmate.

2. Repetition of position.
3. Move kings together in the end game.

4. Positional value of kings is high in the middle of the board, low at the sides and lower still in the corners.

5. Attack and control of squares next to the opponent's king.

6. Checking the king.

7. Opposition of kings.

8. Passed pawns increase in value as they advance. A passed pawn on the seventh rank is worth at least a knight if the square in front of it is not attacked or blocked.

9. Threatening, controlling and blocking squares in front of passed pawns.

10. Threatening and controlling squares containing passed pawns.

11. Pawns on the eighth rank are converted to queens and take the material value of a queen.

12. Threats to queens, rooks and pawns and swap-offs on the

squares containing these pieces.

13. Distance of kings from the pawns.

14. X-rays and skewers.

15. Kings outside the square of passed pawns.

The following account is based on Peter Kent's comments:

While the above elements all had some part in the ordering of moves, most of the moves were decided by a very small subset together with an algorithm which tells the machine to keep searching until a "reasonable" move is found (if one exists).

"Reasonable" is defined by numerical limits which it decides for itself and is based on the value at the base of the tree and the backed-up score.

In this example every move was dominated by the need to prevent the pawns queening. When there were several alternatives for the given depth of look-ahead it selected moves that forced repetition or kept the opponent's king away from the

centre of the board and the two kings close together.

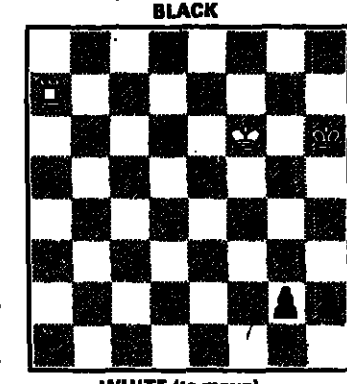
Elements 1, 2, 3, 6 plus material value including 4 and 11 are probably sufficient to solve the problem.

A tree searcher is much more robust than a knowledge-based program but is less precise. It will often find the correct move even if the knowledge it does have tells it to search in the wrong area initially. White's

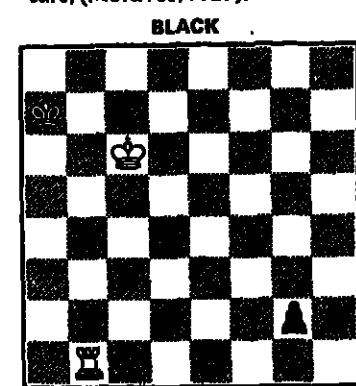
18th move in Master's solution to the above problem is a good example.

White's correct move is R-R8, but this is against most of Master's evaluation terms. It leaves the squares in front of the passed pawns uncontrolled. It does not threaten the passed pawns. Even worse — in the lookahead it finds that it forces the opponent's king to run away from the corner and towards its pawns. Of the 22 possible moves only two have a lower score, and yet Master found the correct move because it was the only possible move. The cost of this bad advice, however, was an increase in the number of positions examined from an average of about 15,000 to 125,000.

The 28-ply calculation used earlier was based on a much shorter solution than the one found by Master (and given by the study's composer Moravec). Can the reader find it?



IN the following chess miniature, (Moravec, 1927):



BLACK (ringed symbols denote White pieces)

Black has awe-inspiring pawn-promotion threats. Yet White can draw. How?

First consider the problem as it presents to a machine system devoid of understanding, i.e. un-equipped with any concepts beyond the bare rules of the

CONFERENCES

A ONE DAY seminar on the distribution and handling of documents in large organisations will be held at the new Kensington Town Hall, on June 6. The event is organised by Fraser-Nash (Mechanical). The seminar will include a short film to introduce Transac, a microprocessor controlled robot delivery system which will be available in Britain later this year. Details from A. Wilson, Fraser-Nash (Mechanical), Burgundy House, Lower Teddington Road, Hampton Wick, Kingston upon Thames, Surrey. Tel: 01-877 1051.

THE evolution and future impact of telecommunications will be discussed at Teletronics '79, to be held in Paris at Unesco from June 11-13, together with an associated exhibition. Organised by AFTEC, the conference was proposed by the Technical Committee 6 and is sponsored by Unesco, the CEC and ICC. Further information and programme from AFTEC, 156 Blvd Pereire F 75017 Paris.

MATERIALS requirement planning is the theme of a one day seminar, to be presented by Heli Master and organised by the Yorkshire and Humberside branch of the British Production and Inventory Control Society. The seminar, which is open to non members, will be held in Leeds on June 11. Details from the administration of the BPPCS on 0278 812786.

BEE, the West of England Electronics Show, which will present electronic equipment components and services, will take place at the Bristol Exhibition Centre, from September 11-13. Organised by Exhibitors for Industry, the exhibition will be supported by extensive promotional campaign. For details tel: 0833 4731.

BELLEVUE, Manchester, will be the venue for the Office '79 conference and exhibition, from June 11-14. The conference will provide a programme of papers from some leading experts in industry, with emphasis on office management and buying techniques. It is organised by Magnum Exhibitions, 157 Station Road East, Oxford, Surrey. Tel: 0833 4731.

EDWARD DE BONO will be giving a three-day tutorial, organised by Infatech, from May 23-25. It is called Lateral Thinking, a special tutorial for DP personnel, and will be held at the Lords Conference and Banqueting Centre, London. For details contact Colin Stead on 0625 35031.

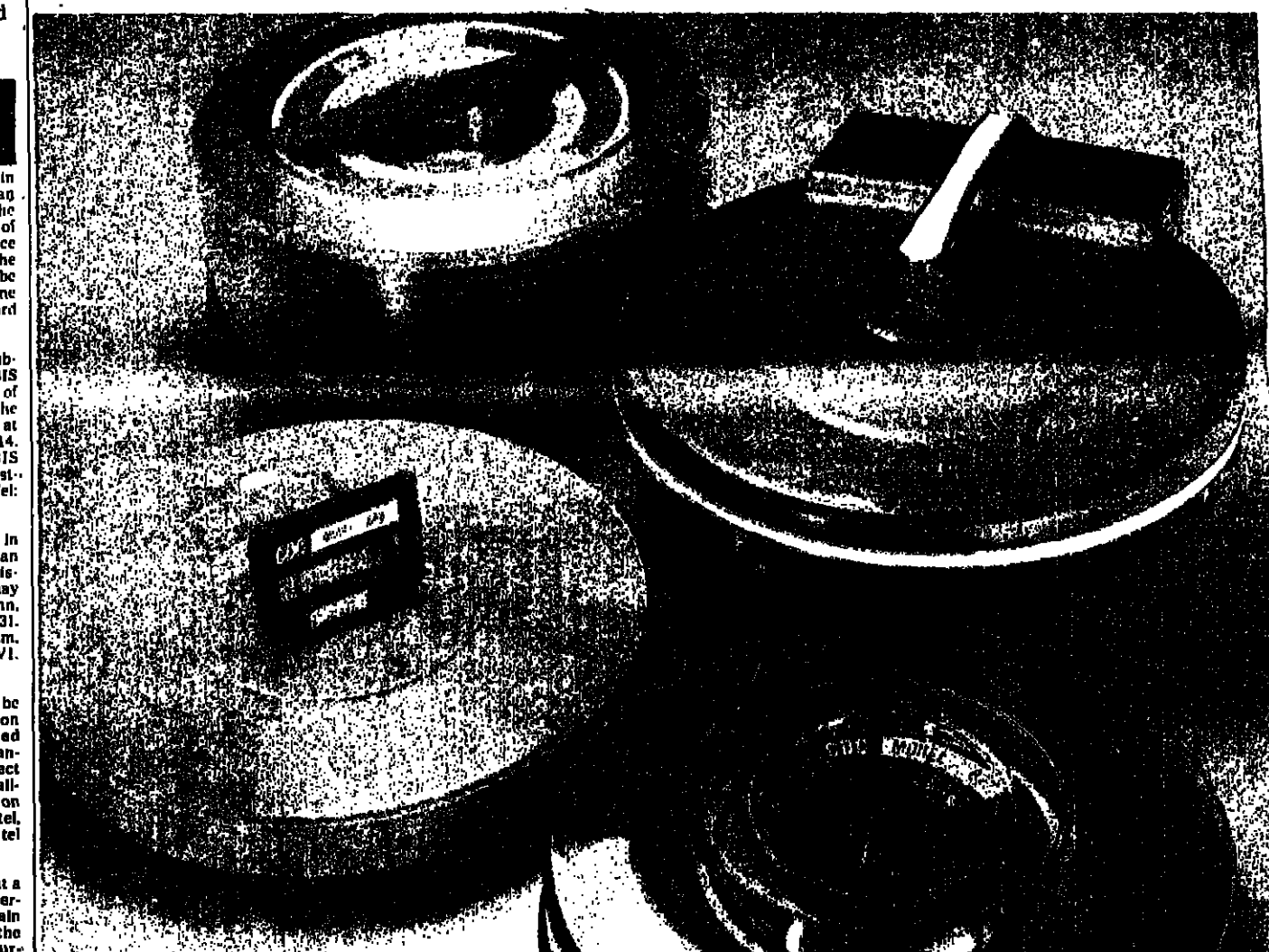
COURSES

SHEFFIELD CITY POLYTECHNIC is organising a course on distributed databases, to be held at the Polytechnic from July 9-20. It is sponsored by Crest, the Commission of European Communities and the Science Research Council. Scholarships for the cost of the course will be awarded by Crest and SRC. Details from I. W. Drifflin, Head of Department of Computer Studies, Sheffield City Polytechnic, Pond Street, Sheffield. Tel: 0742 20811, ext 364.

STRUCTURED systems design and personal development and appraisal are the themes of two courses offered by BIS Applied Systems, both beginning for the first time in June. To be held respectively on June 18-19 and June 19-20, the courses will take place at the Coburg Hotel, London. Details from Jackie Collins, BIS Applied Systems, York House, 189 Westminster Bridge Road, London SE1. Tel: 01-833 0868.

ENGINEERS from all disciplines, who wish to understand microprocessors in engineering, can now attend a short course specially designed for them. No previous knowledge of digital techniques is required. The course is organised by the Inter-University Institute of Engineering Control, and will be held at Warwick University, July 11-12. For further information contact Dr P. K. Sinha, the Course Organiser, Microprocessors in Engineering, Dept of Engineering, Warwick University, Coventry. Tel: 0293-24011.

CIRCUIT analysis by computer is the title of an introductory course given by the Department of Electrical Engineering at Imperial College, London. It is designed for electronics engineers who have not had the opportunity to become familiar with the use of computers. The course will be held from May 22-25. For details tel: Joan Jeffery on 01-859 8111, ext 1470.



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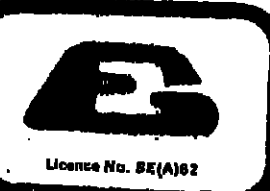
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IBM trails House of Fraser ICL by year switches to Swindon

From front page

enables documents on the host to be viewed instantly rather than after they have been transferred to the 3730 disc; an input format for the Slides information retrieval system, C32.15, and use of the host printer for document output, C54.75.

There will also need a DOSS package on each communicating 3730, costing £41.10, and the direct viewing facility also requires software on the 3730 costing £13.70.

ICL West Gorton to be rebuilt

ICL has announced that it is going ahead with the rebuilding of its research and development centre at West Gorton, Manchester.

The old factory buildings at West Gorton will be demolished and replaced by a complex of offices, workshops and laboratories incorporating the existing tower block which was built only ten years ago. It currently houses most of the 1,400 development staff based at West Gorton.

From now on, West Gorton

RETAIL group House of Fraser has wound down Knightsbridge Computer Services, its division based at Acton in West London that handled most of its data processing workload, and has moved the whole operation to Swindon where it has just opened a purpose-built computer centre.

Called the Fraser Centre, the new Swindon installation houses two ICL 2980 systems, and these have taken over all the work formerly handled by two ICL machines, a 4/50 and a 4/72, at Acton.

will be devoted to R and D. Large systems assembly is being transferred from there to a new site at Ashton-under-Lyne and PC board manufacturing to a new plant at Upper Brook Street, Manchester, not far from the West Gorton site.

Building at the two new locations started last year (CW, May 4, 1978) and is scheduled for completion shortly, according to ICL. Ashton-under-Lyne will employ more than 1,000 staff and Upper Brook Street will have nearly 500.

The two 2980s come with one and two Megabytes of main memory and both emulate the System 4 environment under DME/4 at the moment, although the plan is to run the two-Megabyte machine under VME/8 as soon as enough of the System 4 workload has been converted.

Before the Fraser Centre was completed, the one-Megabyte 2980 was already running at the nearby W. H. Smith computer centre, where it was installed in April 1978 on a temporary basis for training House of Fraser staff and for developing and sizing DME/4 work (CW, April 6, 1978).

Under its agreement with House of Fraser, W. H. Smith was able to offer System 4 and 1900 DME services on the 2980 on a bureau basis.

Chinese journal
A CONTROLLED circulation computer monthly for distribution in the Peoples Republic of China has been launched. It is being written and printed in Hong Kong, comes from Computer Publications Ltd and is called China Computer Monthly.



COGARVIEW

Billions wasted by lack of planning

THERE are well over 11,000 government-owned computers in the US; probably no one individual, office or even databank knows quite how many. Each one contributes in some measure to the executive's attempts at economic and social planning.

Yet the computers themselves operate in a totally haphazard environment in which lack of planning has wasted billions of dollars of the very economy which the computers are supposed to be... and so on.

This assertion comes not from me, but from an even more

impeccable source: the government itself. Its Comptroller General came out this summer with a report which fairly sizzled over the inadequacy of the government's computing methodology.

Because government agencies had failed to come up with any standards to compare with, say, the standards adopted by the banks in the 1950s to improve cheque processing, incompatible systems abounded, leading inevitably to duplication of work and resources. And because agencies wanted to avoid the labour of software conversion, they were virtually locked into single suppliers, losing all the potential advantages of competitive tendering when it came to equipment replacement.

The Comptroller General's report provides plenty of ammunition for the economic hawks in the US, implacably opposed to all forms of central planning and government regulation of business. "If the government cannot even control its own computer systems," they will be saying no doubt, "how can it possibly control the far more complex macro-systems of the economy or the environment?"

But the argument against planning in general seems to be derived from an unfair reliance on particular examples of planning failure. I cannot accept that attempts to set national priorities and programmes aimed at their achievement are necessarily unproductive. The problem is that the resources applied to these attempts are rarely sufficient to guarantee success.

In the West the deficiency, as exemplified by the Comptroller General's report, tends to be methodological. Some would say that is because people brought up in a free market environment (well, more or less free) are basically ill-adjusted to the concept of national planning and therefore do it badly. To be sure, we have the hardware, but so far we don't seem to have developed the hardware in an efficient manner.

But there are exceptions. The US national census is an enormously successful instance of applied methodology. It is incredibly detailed. I can go into the census bureau, buy the demographic profile of New York City, and instantly I know how many Latvians there are in the city, first or second generation, whether they live in homes with bathrooms, and so forth.

If Big Brother is not yet exactly watching Americans, he is certainly counting them with considerable effectiveness.

The US national census is, of course, heavily computerised. It could not conceivably be undertaken otherwise. Its analyses form an unparalleled database for long-term socio-economic planning, if we but knew what to do with this great mass of raw information.

The US census, in fact, is not at all dissimilar from those undertaken by East European countries, where a comparable level of hardware and software investment has been poured into amassing demographic statistics — whence all good planning flows.

A small country like Hungary, for instance, just now planning

its second computerised census, stores the data on 15 200-Mbyte disc units, uses Honeywell's Integrated Data Store (IDS) software for processing, and will employ something like 80,000 inspectors checking the quality of the data collected.

Talking of methodology, it is interesting to note that the demands of the Hungarian national census have led to a new Rjad standard for expressing the language's nine accented vowels. Up till now, only four of the accented vowels have been included in the usual sign stock of Hungarian computers; this was adequate for normal transactions, any ambiguities being resolved by context. But it would not do for the census, since many Hungarian surnames are only distinguishable by accurate rendering of their accented vowels.

The Soviet Union is probably the most conspicuous example of the planned economy, and economists delight in pointing out its shortcomings, often comparing its attempted hierarchical layering to that of a haystack. But the dedicated scientists at Gosplan have to contend with inadequate hardware and whimsical political decisions. How could anyone plan the economy of a country as complex as the USSR on a couple of obsolete ICL System 4/70s and a pair of Elliotts which ought to be in a museum?

As for political whimsy, what better illustration than the level of car ownership in Georgia, favoured in regard to consumer durables since Stalin's day. The Georgian motorists have precious few roads to drive on, since prestige demands that new roads be built in and around Moscow. Even the planned economy has its irreconcilable political priorities.

In fact, of course, all Western economies are far more centrally planned than many people realise. The US government has an enormous influence on R&D, for instance, through its funding mechanisms. Businessmen complain constantly of the contradictory demands of the country's federal agencies. Energy, though nominally in the hands of private companies, is so regulated as to be effectively a national service. The same goes for communications — to date.

This is inevitable. The world is too complex to be left to the interplay of market forces alone. Businessmen themselves, in many instances, are coming to realise this. Oil company presidents and no less a capitalist than Henry Ford II have recently called for more, not less, government intervention in the energy market. Businessmen operate best in conditions of stability, and stability is what national planning can provide, properly undertaken.

But it is the effectiveness that counts. Bad planning is worse than none at all — it creates the illusion of stability without the reality. What is wanted is a concerted programme to work out a methodology for national planning. The work of federal agencies needs to be codified and collated, inconsistencies ironed out, realistic targets set and unrealistic mandates removed. It will take political nerve and a hell of a lot of money.

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- ★ All electronics housed in the printer terminal itself allows choice of desk-top or floor mounting
- ★ Receive only (RO) printer option available (Keyboard of the KSR is removable)

- ★ Quietest impact printer terminal available — ideal for office use
- ★ Compact, modern styling
- ★ Immediate availability
- ★ Competitively priced and dependable production through parallel manufacture in Europe and USA

On top of all these advantages, the Tally T-1612 has positive above and below the line tractor feed, many switch-selectable functions, 160 cps optimised bi-directional printing, six different type fonts, self-test, superb print quality, and many optional extras. All this proven performance at a very competitive price.

For further information on Tally T-1000 series Serial Printers, contact Tally Ltd or one of our authorised distributors:
Data Design Techniques Tel: 01-207 1717 Computer Marketing Tel: (04026) 7161
Creative Systems Tel: Dublin 452311 Fortronics (File) Tel: Dalgely Bay (0383) 823121
Tally Limited, Tally House, 7 Crenyll Road, Reading, Berkshire RG1 8NQ

TALLY

Fill in and send me full details of the Tally T-1612 or the Tally T-1000 series.

Name _____ Position _____ Company _____ Address _____

CV

Logica

Logica is a world leader in computer consultancy and data communications systems.

Specialising in:

- policy consultancy
- turnkey systems
- advanced computer technology
- on-line, real time systems
- message switching, data transport networks

Experienced computer professionals are invited to apply for the position of:

Senior and Principal Consultants

in Logica (Benelux) BV, Logica's operating company in Rotterdam.

We look for:

- a degree or equivalent
- 10 years experience in systems implementation and consultancy
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We offer:

- a highly challenging professional environment
- fringe benefits appropriate to these high level appointments
- excellent working conditions in a most attractive, progressive and harmonious society

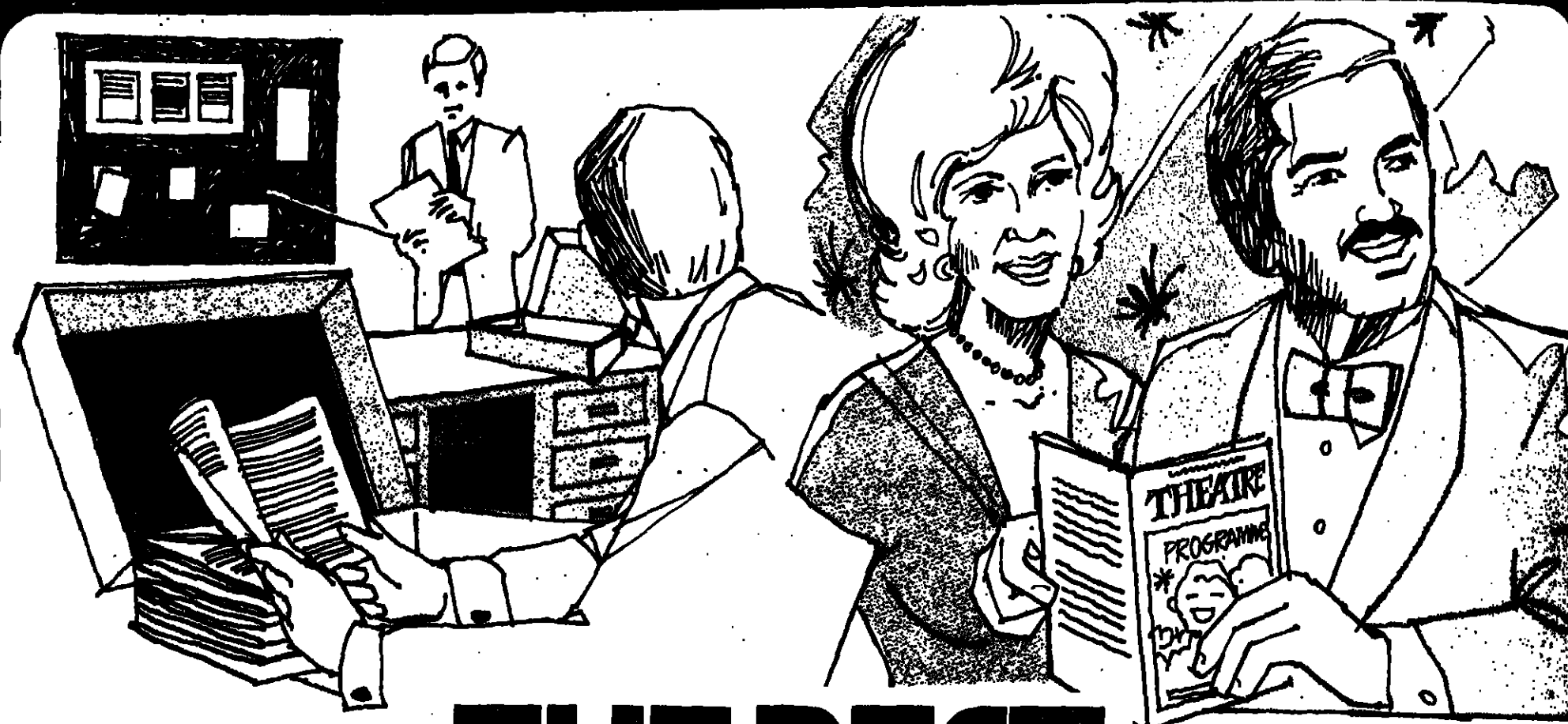
Top Consultants for Holland

Either write giving your qualifications and experience to:

Mrs L den Haring
Logica (Benelux) BV
Vasteland 12,
3011 BL Rotterdam,
The Netherlands.
Tel. nr.: 10-33 08 44

Or if you require further information telephone Logica in London (01-637 9111) and ask for Hector Hart.

App 10/1/79



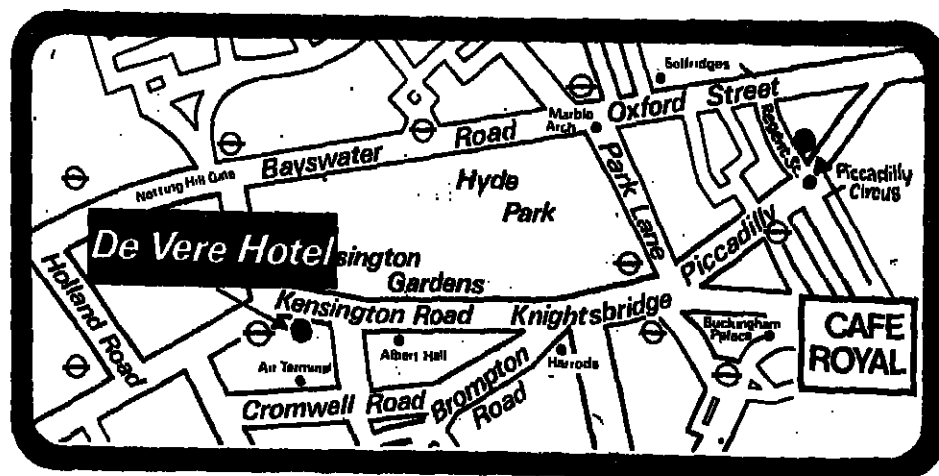
THE BEST OF BOTH WORLDS

Just a few miles from the bright lights of Piccadilly, in one of London's most pleasant suburbs, the bright light of opportunity is calling to SOFTWARE ENGINEERS AND MANAGERS. Our client urgently needs real time software designers and managers to staff up their expanding stored-program controlled telecommunications operations. This involves the full range of complete hardware from micros to large purpose built processors. They are also looking for experienced HARDWARE LOGIC DESIGNERS keen to get into this major field.

The work is varied, and challenging: the teams are youthful, enthusiastic and energetic: the rewards are good and the prospects are excellent — and our client is very helpful to those wishing to relocate.

We shall be at the De Vere Hotel, 60 Hyde Park Gate, Kensington, from Monday 14th May through Friday 18th May, 9.00 a.m. until 9.00 p.m. (or the bar closes!) Call in and talk over careers with us.

Or ring Bill Byrne now on 01-629 7262 (reverse charges).



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JBA

Product Marketing Consultants

London Based to £9,000
Following our success over the past few years in marketing products such as the 1DMS database management system, Seicon has formed a Products Division which is wholly dedicated to the development and marketing of software and/or hardware products. Our minimum requirement is for two consultants to take responsibility for identifying and specifying products in particular areas.

Applications Software Product Consultant

The candidate should have a minimum of six years' experience of applications work, including system analysis and project leading in a commercial environment. Experience of manufacturing or financial applications would be of particular interest. He/she should be fully conversant with IBM 360/370 hardware and software. Experience of DL/I would be an advantage.

Micro Product Consultant

The candidate should have a sound background in commercial data processing, together with up-to-date knowledge of the latest micro computer technology. He/she should be able to not only demonstrate this knowledge but also an awareness of how it can be applied in a small business environment. Experience of running or helping to run a small business would be a considerable advantage.

Contact: Margaret Stevens

HOLLAND

PDP (MUMPS) Programmer

salary: v. high

A leading Medical Systems manufacturer seeks a Programmer with software experience on PDP equipment, together with the ability to engage in customer support activities. The peripheral equipment is mainly of a modular, electronic structure with a central DEC processor and A-D converters acting as interface devices.

Applicants must have a sound knowledge of MUMPS and a background on any PDP computer system. The customer support aspect will involve user contact and therefore a personable character is essential.

Contact: Mike Creamer

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W1. Tel: 01-491 4478

APL Programmers

London based with International travel £8-10K
SIA is one of Europe's leading technical bureaux offering timesharing, conversational remote batch and batch processing services, through a network based on large mainframes. They are commencing marketing of a new database package designed for use on IBM 3031/33 hardware and programmed in APL. Candidates should ideally be graduates and an extensive knowledge of APL is naturally mandatory. The successful appointees will spend July to September in France undergoing company orientation and technical training - all expenses paid. This is an excellent opportunity to work on new technology and travel with one of the most progressive companies in Europe. Contact: Margaret Stevens

Systems Analyst

London to £8,400 + benefits
Our client is a major oil-drilling services company, with over 3,000 field technicians operating in 55 countries worldwide and an annual turnover which is increasing by 25% + per year. Analysts with a sound business background are required to join a small team with an IBM 370/125 under DOS/VS - due for upgrading in the near future - and a T.P. link to Paris, which is about to embark on developing a completely new range of Financial Systems. Each Analyst has complete project responsibility from feasibility through to implementation. All usual big company benefits apply - a superb opportunity with real, long-term career prospects.

Contact: Andy Wright

Database Consultant

London Up to £8,000
We have been retained by MATHEMATICA PRODUCTS GROUP, to recruit a Consultant to support their RAMIS Database and nonprocedural language system in client organisations throughout the U.K. Candidates will have the opportunity to carry out consultancy assignments and give both pre and post-sales support for the product. Applicants should have at least three years experience in the design and development of commercial applications with two years using RAMIS or another recognised database system. Salaries are negotiable according to experience.

Contact: Jim Baker

A leading London Stock Jobber is embarking on a large development programme and requires the following additional Staff —

1. ANALYST/PROGRAMMER

Salary to £6,750

3 years' plus experience on I.C.L. equipment, knowledge of Cobol, Plan and 2904 On-Line Techniques preferred. Previous involvement in Financial applications an advantage.

2. PROGRAMMER

Salary to £6,250

2 years' plus experience on I.C.L. equipment in depth knowledge of I.C.L. Software, Cobol, Plan and 2904 On-Line Techniques.

The Company also offer the following benefits —

Paid Overtime
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Applications in writing giving brief career history to

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2-5 Austin Friars
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The London office of Europe's leading Computer Consultancy needs a

Senior Fortran Programmer

We're ambitious and developing fast in the business of supplying computing answers to daily business problems.

You can share in our dynamic future if you have a minimum of 2 years' Fortran experience in a timesharing environment.

The applications are mainly Financial, using DEC and SIGMA operating systems. You will be responsible for other

programmer and some systems analysis will be involved.

Initial salary up to £5,200 pa.

Ring: Madeleine Hennings
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GSI Limited,
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London EC1.

gsi

Technical Writer

Help us to Help Management
run their Business

(Gloucestershire)

Racal-Redac Limited are specialists in the development of Computer Aided Design and Business Control Systems based on the D.E.C.P.D.P11 Computer.

Our growing customer base both in the U.K. and overseas has resulted in the expansion of our technical writing team who are engaged in the composition and production of user manuals. In particular an opportunity exists for an experienced Technical Writer who will be responsible for the user documentation, which is in the process of being computerised, for our commercial system, the Redac Executive.

The Redac Executive is a mini computer - based management aid which is utilised in areas such as budgeting, forecasting, sales, purchasing and stock control. It is simple to operate and has become recognised as the ultimate in man-machine interaction.

The Technical Writer (male/female) will need to operate and to understand the system and will constantly liaise with our programmers to produce accurate but easy to use manuals.

Racal employment benefits are attractive and include 24 days annual holiday and a Company pension and free Life Assurance scheme. Racal-Redac is situated in the heart of the pleasant Gloucestershire countryside and relocation assistance will be provided in appropriate cases.

If you feel you could make a success of this challenging opportunity in a new growth area, please write with details of age, experience and present salary to: B. Ashcroft, Personnel Officer, Racal-Redac Limited, Newtown, Tewkesbury, Glos. GL20 8HE. Telephone: Tewkesbury 294161.

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RACAL

Recruitment



in Informatics

Interdata Programmers West Germany

Salaries: to £15K

An International client with a long track record of successfully implementing new systems for European Public Institutions and Government Agencies is seeking several INTERDATA orientated Programmers for a long standing German project. They now require additional personnel to cope with the installation of new hardware and extended applications areas. You will become a member of one of several specialist project teams in which you will make a valuable contribution whilst simultaneously expanding your own technological frontiers. We are

specifically requested to recruit only FORTRAN and Assembler Programmers who are fully familiar with Interdata 8/32 hardware. You should therefore offer two years or more programming experience on this machine. The applications areas in which you will be involved comprise mathematical modelling, testing, data communications and verification. On completion of the project you will be given every opportunity to relocate to one of the company's other European offices. L/10/05/A

Sr. Project Analyst-Managers Thames Valley

Salaries: c £9.5K

A leading commercial organisation with recently acquired IBM hardware requires Senior Project Analysts and Project Managers for its advanced distributed processing plans. Currently, the main computing activities take place in U.K. with supporting Data centres in U.S. and E.E.C. The Company is seeking several additional personnel to conduct an appraisal of its proposed software and project plans within the particular areas of accounting and audit

operations. Ultimately, it will be essential to control and monitor both the progress of the total project and also the allocation of staff. Ideally successful candidates should hold a numerate degree and have had five years experience both within programming and systems analysis/design. Experience with recent IBM hardware in an on-line environment is a decided advantage, as is the desire to travel during the course of employment. L/10/05/B

Camac Programmers Copenhagen or Holland

Salaries: to £15K

Scandinavia's leading Systems House and Software Consultancy seeks several Programmers with current expertise of software development and design on micro processors, preferably Intel 8085/6, Zilog Z80 and Motorola 6800. You will be required to

relocate immediately to one of our client's European offices. It is anticipated that employment will commence in either May or June. For further information telephone one of our Recruitment Advisers immediately. L/10/05/C

U.K. Re-Insurance Group City of London

Salaries: £6.5K-£9.5K +

A leading City of London based Re-Insurance and Merchant Banking Group with a recently acquired U.S. subsidiary with extensive and soon to be upgraded computing hardware requires additional D.P. personnel up to Project Manager level. Ideally you must offer a programming background in PL-1 under OS or MVS and will either have on-line expertise or a desire to move into this area or Data Base design through participation in our client's training programmes. Of particular importance is the

ability to work as a member of a Specialist Project team under strict documentation and programming standards. A second language — ASSEMBLER/COBOL — would in addition be of considerable advantage. Our client in addition to an excellent salary offer a reduced rate mortgage, private health and non-contributory pension schemes plus restaurant facilities. Interviews will be held on the company's premises towards the end of the current month. L/10/05/D

Analysts + Programmers New South Wales

Salary: \$A 14,000-\$A 22,000

One of Australia's leading Finance Companies in the fields of Merchant Banking, Foreign Exchange and Portfolio Management is seeking a variety of d.p. staff who wish either to emigrate permanently to that country or to take a minimum of 2 years contract. Applications Programmers should offer at least two years' practical experience in COBOL and preferably on large up to date Burroughs hardware. Inevitably a

banking or insurance background will be an added bonus. Systems Analysts must show a prior programming background and demonstrate that they have completed at least one system from feasibility to implementation. For further information regarding interviews in London, you should contact us either by submitting a detailed C.V. or calling before 15th May. L/10/05/E

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London W1N 9HA

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More and more clients offering salaries up to well over £10,000 have forced us at Real Time Mini's place to man — or, rather, woman — the telephone 24 hours a day.

Reason is that we want to be available to qualified callers who can't sleep for wishing they earned more money.

Like PROGRAMMERS, PROGRAMMER/ANALYSTS, SYSTEMS DESIGNERS and PROGRAMMERS, SOFTWARE ENGINEERS, PROJECT MANAGERS and HARDWARE ENGINEERS with at least a year's Real Time Mini or Micro experience — any configuration — and Assembler and/or high level language.

If your experience includes DEC — especially using RSX11, RSTS/E, Intel, Motorola Micro or Interdata 32 — don't even apologise for calling at 11 p.m.

If you also have a degree — computer science or other maths-orientated subject — we'll wake up even faster.

Applications: Commercial business systems, Customer support — various roles, Process control, Flight simulation, Micro processing, Word Processing, Communications — tele and otherwise Message switching, Lecturing and training, Military systems, Automatic test systems.

Locations: London, Home Counties and further afield — including W. Europe.

Ring Real Time Mini's 24-hour, personal answer hot line now — 01-836 9719 or 9882. Day and night, ask for Beryl McLaren.

Jupiter Computer Appointments
(Real Time Mini's Place)
Suite 41/42, 12-13 Henrietta
Street London, WC2

COME TO WHERE THE HILLS
ARE GREENER

— AND CLOSE AT HAND!

Our Client, Cara Data Processing Ltd., is a wholly owned subsidiary of Aer Lingus and the largest computer services organisation in Ireland. Over the past four years, the company has trebled its turnover, expanding rapidly both at home and overseas. Accordingly, there are now exceptional career opportunities for talented computer personnel, based in Dublin. It is an opportunity not only to develop your career but to enjoy a most attractive lifestyle. Dublin is still only half an hour's drive from mountains and countryside. If both prospects interest you, read on...

CARA operates four main divisions: Consulting, Computer Hardware, Caralink (interactive time-sharing) and a Data Centre Division. The latter is based on IBM and Honeywell computers and markets packages such as Carapay, Caradebt, Cashmaster (Credits) and Financialman (Nominal Ledger). It is also involved in the development and maintenance of custom-built systems.

A number of vacancies now exist for professional D.P. staff based in the Data Centre in Dublin: —

SYSTEMS ANALYSTS/ LEAD PROGRAMMERS

with considerable programming and systems experience involving a number of major projects.
Salary Scales: £5,926 — £8,276.

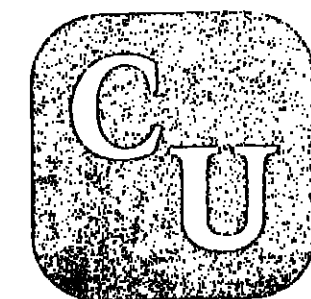
SENIOR PROGRAMMERS

with a minimum of 3 years experience.
Salary Scales: £5,556 — £8,750.

For both vacancies a knowledge of IBM 360 Assembler or COBOL is desirable. So if you would like to move to Ireland and into a flourishing career, write at once, enclosing a Curriculum Vitae to Barry Crowley at



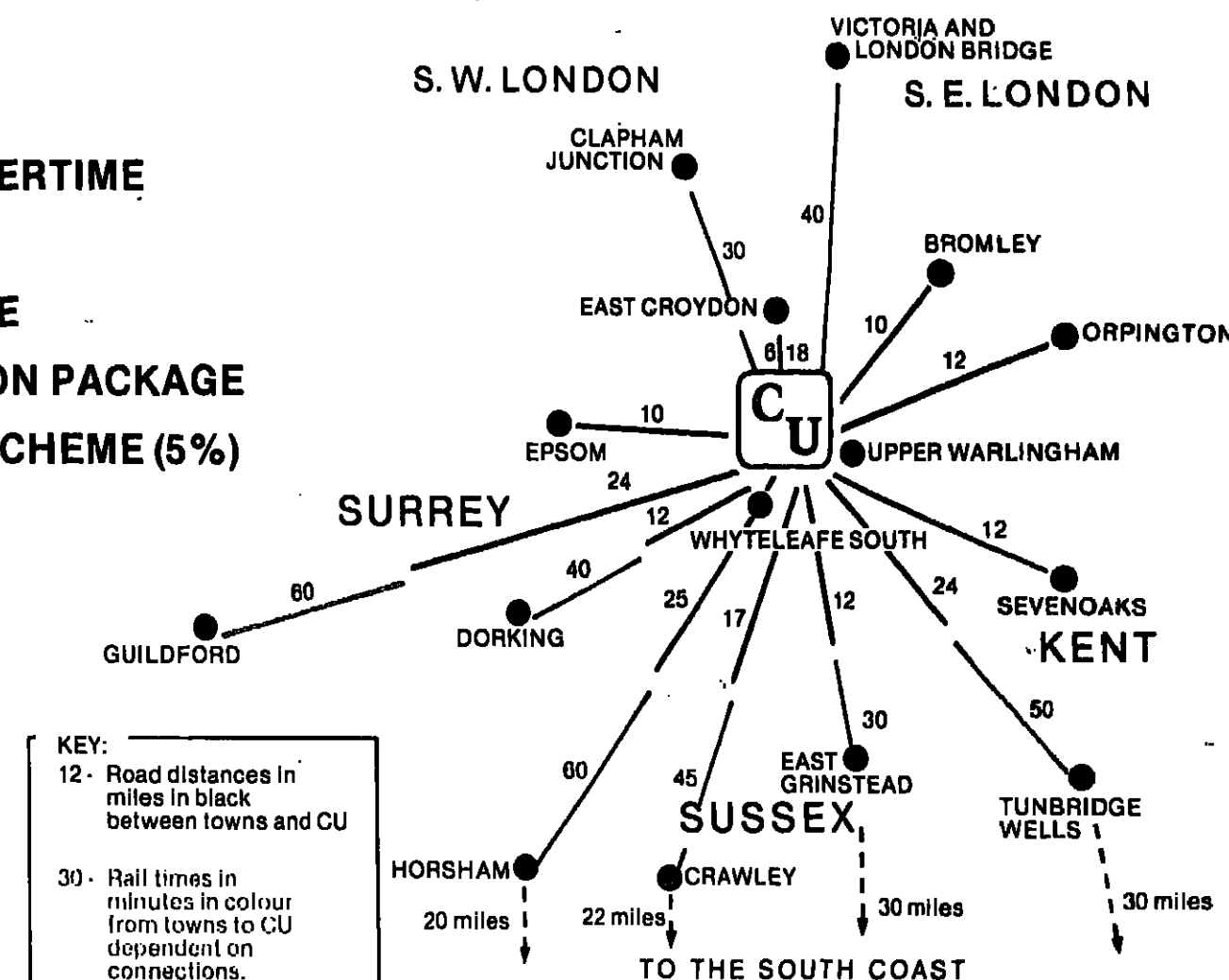
PARC,
P.O. Box 834,
Wrights Lane,
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London W8 6SR.



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- ★ GOOD SALARIES ★ PAID OVERTIME
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- ★ TWO STATIONS NEARBY:
Whyteleafe South, Upper Warlingham.
- ★ EASY COMMUTING FROM:
Central London, Kent, Surrey and Sussex.



Q. Which company is advertising for Programmers?

A. Commercial Union Assurance Ltd.
Q. What level of experience do I need?

A. At least 18 months as a COBOL or ASSEMBLER programmer, on any machine.
Q. Where would I work?

A. In modern offices, pleasantly situated, at Whyteleafe, in Surrey.
Q. How would I travel?

A. By car — no traffic jams, pleasant country roads, ample car parking.
By Train — Whyteleafe South B.R. Station is almost opposite the offices and Upper Warlingham is readily accessible.
Q. What if I cannot commute?

A. The company offers an excellent relocation package.
Q. If I relocate can I visit the area and, if married, bring my spouse?

A. Of course — the company want you to be settled. Personnel will assist with temporary accommodation and any other problems.
Q. Will I improve my earnings?

A. Probably, but of course it depends on what you currently earn. Starting salaries will be reviewed after six months and the company has cost of living and performance reviews in June and March each year.

Q. Is it a vast installation with problems of scale?

A. The installation will shortly be a large dual 3031, operating under MVS, and using ROSCOE. Distributed Processing is currently being trialled for a large branch network. However project team organisation creates generally small, closely knit teams with a combination of analysts and programmers at all experience levels.
Q. Are the benefits real?

A. Definitely so and they are available to all after a short qualifying period.
Q. How does the preferential mortgage scheme work?

A. With the CU scheme you only pay 5% interest and mortgages are more readily available, at significant levels of advance.
Q. Is there a Pension Scheme?

A. As you would expect with a major insurance company, an excellent scheme which has only a 2% contribution. Life Assurance cover is four times annual salary.
Q. How can I improve the quality of my life?

A. The working week is only 33½ hours. There is flexitime so you can start as late as 10am or finish as early as 4pm.
Q. If I work longer can I earn more?

A. If overtime is necessary you are paid for the extra work performed.
Q. Will I be expected to undertake standby duties?

A. Yes, on occasions but when you do generous payment will be made.

Q. Can I eat locally and are there luncheon vouchers?

A. Better still there is a restaurant on site and meals are free.
Q. Does the company encourage sport and recreation?

A. Yes, the company has its own sports ground in Kent, with facilities for most sports. Also at Whyteleafe there is a recreation area with facilities for snooker, table tennis etc and an active chess and bridge club.
Q. Will the company train me?

A. In all the skills you need to equip you for the work you will be undertaking. This includes other programming languages, new equipment and different responsibilities.
Q. Is there a career path?

A. There are many. You may wish to stay in programming or move to analysis. Either way you can progress as quickly as your ability and willingness to accept more people or technical responsibility permits. Promotion is on merit and will occur as appropriate — it is not dependent upon waiting for the annual performance review.

Positions open to male and female applicants, please telephone (24 HOUR ANSAPHONE) to discuss, write or send coupon to address below, quote ref CW134-9H

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LONDON AND MANCHESTER



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TEL. Nos. HOME _____ BUSINESS _____

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DEC/VAX

Immediate twelve month contract for the right applicant with experience in production control on the above.

c220 p.w.

CICS/PL1

Our client in the Midlands urgently requires programmers to work on a CICS on-line system using PL1/DOS/VS. Various applications - long term projects.

c230 p.w.

IBM/VS

Contracts of varying lengths for Cobol or Assembler programmers. Various projects throughout the North & Midlands.

c220 p.w.

PDP11 RSX11M/D CORAL 66

Our client in the North, requires an immediate programmer with some design experience. Projects/production control experience vital. 12 month contract.

c220 p.w.

HONEYWELL GCOS COBOL

Three months plus contracts throughout the North and Midlands for experienced Honeywell programmers. Various projects.

c220 p.w.

IMS/COBOL

Cobol programmers with IMS (both DB & DC) required by our client in the Midlands. Development. Contracts six months plus.

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PDP11 RSTS/E MACRO 11

Basic +2 programmers required for our Midlands client. Manufacturing environment. Contracts six months plus.

c230

ICL EXPERIENCE?

Plan, Cobol, Fortran. Contract opportunities throughout the North & Midlands. Numerous applications.

c220 p.w.

IBM/VS

370 Cobol programmers required by a number of our clients. Contracts of six weeks plus North & Midlands.

FOR DETAILS OF THESE AND OTHER CONTRACTS PLEASE CONTACT
JUDY LEES/LYNN BARTON ON 061-833 9341/5 (24 HRS.)

ANALYST/PROGRAMMERS LANCS

c25,500

Pleasant location. Staff required to supplement a project team for the expansion of work at present IBM 370 OS Cobol experience vital.

Ref: 1065

PROJECT MANAGER LIVERPOOL

TO £7,500

Our client requires a project manager with factory/manufacturing experience. Work involves planning and installing new systems. Advanced IBM hardware.

Ref: 1143

PROJECT LEADER MIDLANDS

£6,300 +

Project leader required for on-line development team. Main involvement systems, design work on ICL equipment Cobol/Plan.

Ref: 1140

SYSTEMS ANALYSTS YORKS

c26,000

Our client require systems analysts to get involved on a conversion and install new ICL equipment. Productivity bonus, relocation expenses.

Ref: 1073

PROGRAMMERS LANCS

TO £5,500

A large concern require Cobol or Assembler programmers to work on IBM hardware in an expanding installation.

Ref: 1146

SENIOR PROGRAMMERS NORTH WEST

c26,000

A house purchase scheme and flexitime are offered to successful applicants with Cobol or Assembler experience. New installation.

Ref: 1022

SYSTEMS ANALYSTS NORTH WEST

c26,500

Our client require experienced systems analysts to work in various installations throughout the North-west. ICL experience an advantage.

Ref: 1102

PROGRAMMERS DERBYSHIRE

TO £6,000

Our client require Fortran programmers to work on DEC equipment in a commercial environment. Very pleasant location.

Ref: 1124

SYSTEMS PROGRAMMER SCOTLAND

c27,500

Our client requires an experienced systems programmer to work on IBM equipment. Pleasant location, reasonably priced property.

Ref: 1088

FOR DETAILS OF THESE AND OTHER VACANCIES PLEASE CONTACT JOAN JOHNSTONE
ON 061-833 9341/5 (24 HRS.)

DATA PROCESSING RECRUITMENT SPECIALISTS

Computing
Services
Association

PROGRAMMING OPPORTUNITIES

12 MONTHS EXPERIENCE TRADE ANALYST PROGRAMMER LONDON

c26,000

Our client, one of the world's leading suppliers of high technology products and services to world-wide energy and industrial markets, are seeking a trainee analyst programmer. If you have 12 MONTHS commercial COBOL programming experience this is a fantastic opportunity. They have large T.P. network with links to Europe and offer full training in database and T.P.

★ Fantastic job opportunities
★ Excellent prospects for promotion
★ Training in ANALYSIS, T.P. and DATABASE
REF: 2082

PROGRAMMER CITY

c26,000

Do you have potential to become a team leader? Do you have 2 years' COBOL programming exp? If so, then this international conglomerate would like to hear from you. Successful candidate will have opportunity to supervise and become involved in system design Burroughs machine experience an asset.

★ Excellent promotion prospects
★ Season ticket scheme/sports & social club
REF: 7011

PROGRAMMERS CITY

c26,500

Expanding commercial body based in the City seek programmers with minimum 6 MONTHS experience of ICL COBOL to move on to analysis. Company retain ICL 1800's and DEC PDP 11's. WITH APPROX. £4M invested in their computers. The successful candidate will find him/herself in a dual role - working on both ICL and PDP machines and training will be given wherever necessary.

★ Large numbers of brand new projects
★ Xmas bonus
★ Subsidised canteen
REF: 7008

IBM PROGRAMMERS LONDON

to £5,500

Move onto IBM 3031! If you have 12 months' IBM COBOL experience and a strong desire to succeed - then let us arrange an interview for you with this leading engineering group. They can offer an attractive career and are going over to MVS and CICS when they install the 3031. Programmers with DL/VSAM and CMS experience will have a distinct advantage.

★ Incentive bonus and Xmas Bonus
★ Private pension/Life/STLS
REF: 22A

PROGRAMMERS CITY

to £7,000 + MORTGAGE

Programmer get into banking superb opportunities open for several IBM COBOL programmers with MINIMUM 18 months experience, RPOII an advantage, to join an exciting environment with all new development work. Company have large T.P. monitor using CICS and have new IBM equipment on order.

★ Excellent promotion prospects
★ Paris include sub-mortgage, sub restaurant, ticket scheme and non-contributory pension
REF: 2266

PL/1 PROG LONDON

c27,000

World-wide engineering company engaged in processing of hydro-carbon products is currently installing T.P. monitor to large IBM 370. With expansion, they are recruiting PL/1 programmer with at least 3 years' experience and preferably with either CICS/VS or ISM. This is a very interesting position and person will become involved with accounting, cost evaluation and project management systems.

★ A was move - good promotion prospects
★ Internationally famous company
★ Excellent career prospects
REF: 2261

SYSTEMS ANALYST to £7,000 S. LONDON

GET INTO SYSTEMS ANALYSIS! If you are YOUNG, AMBITIOUS and are presently employed as Programmer/Analyst then phone us NOW. Fantastic opportunity to join small friendly team at the beginning of new systems development. Super chance to extend your experience. The ideal applicant will have at least 18 months COBOL programming background.

★ Work with very sophisticated computer systems
★ New modern equipment
★ Superb career opportunities within the group
REF: 2301

PL/1 PROGS ALL AREAS to £8,000

We have approximately 50 jobs available throughout the London and Home Counties areas for PL/1 programmers. We have excellent opportunities for learning new languages, e.g. ASSEMBLER and COBOL, learning new database i.e. CICS, IMS, TOTAL and fantastic opportunities to go into systems and Analysis. YOU CAN'T miss this opportunity so phone NOW!

★ FANTASTIC salaries
★ All areas
★ Extensive training
REF:

MINI PROGRAMMERS LONDON

to £8,000

Our client, a famous international group is seeking 3 programmers with at least 18 months' experience of commercial applications on MINIS or MICROS. Ideally on DEC PDP minis using BASIC, BASIC+2 or MACRO under RSTS/E or RSX11. These are very varied positions which involve many new and interesting projects.

★ Regular salary reviews
★ Super fringe benefits
★ Excellent promotion prospects
REF: 2237

SUPPORT ANALYST W. LONDON

to £7,500

Ambitious young person is sought by leading British company to join small progressive team working with powerful database system. Ideal candidates will have 3 years' programming in FORTRAN with time sharing on real-time experience. Will be developing and implementing databases for clients and will be responsible for all aspects of their support.

★ Excellent pension, sick leave, life etc schemes
★ Good career progression
★ Relocation expenses
REF: 2247

SENIOR MANAGEMENT

PROJECT LEADER U.K./SCANDINAVIA

£9000c

Famous international group is seeking Project Leader to develop major database system for distribution business in Sweden. BASED IN ESSEX the successful candidate will take full responsibility for co-ordinating between the two countries and the total systems development from start to finish, using the most advanced software available. If you would like to know more - then ring NOW!

★ Some travel to Sweden
★ Excellent career prospects
★ 1st class relocation expenses
REF: 7017

MANAGER LONDON

£12,000 NEG

As market leaders in their field and with exceedingly high turnover, this well-known organisation has exciting plans for the future! They seek senior person for their management services division with proven management ability and successful achievement in the implementation of medium-sized systems preferably in an IBM environment. Position will involve planning and advising for information and systems services of company.

★ Excellent career prospects
★ Excellent perks include Co. CAR
REF: 7006

SYSTEMS ANALYSTS CITY

to £8,500

Computer services division of a large financial services company require 3 systems analysts for their various groups. Ideal applicants will have programming backgrounds with good IBM systems, real TIME experience. If you can communicate effectively at all levels, have the ability to contribute to business decisions and have accounting or financial systems experience.

★ Excellent fringe benefits
★ Good career progression
★ Involvement at all levels
REF: 2288

SENIOR MANAGEMENT

Multi-national conglomerate company are seeking a consultant with at least 5 years' DP experience. Our clients are heavily involved in MINI and MICRO computer systems. The ideal applicant will have sound mini experience and preferably will be able to take initiative and responsibility, manage projects and staff and be able to communicate at both business and technical levels.

★ All expenses paid
★ Excellent fringe benefits
★ Good promotional prospects
REF: 2233

CONSULTANT LONDON

to £10,000

International conglomerate has several openings for successful consultants to work throughout the London area. They are seeking computer professionals to work in a financial environment. Candidates will be expected to have any minitrame database experience either IDMS, IMS or DMS etc. This is a superb opportunity to enhance your career.

★ Challenging positions
★ Excellent company benefits
★ Super prospects within the group
REF: 2230

BUSINESS SYSTEMS S. LONDON/KENT

to £8,500

Our client an international engineering company has a new opening for a Business Analyst. The position involves close liaison with the user department problems solving and seeking improvements. To work on various projects. Ideal applicants will be under 40 and have experience in manufacturing environment preferably on material and production control.

★ Excellent pension, sick leave, life etc schemes
★ Good career progression
★ Relocation expenses
REF: 2247

KNIGHT PROGRAMMING SUPPORT LIMITED


ROYALTY HOUSE, 72 DEAN STREET, W1. 01-734 0152/434 1363 (24 hrs.)

RECRUITMENT CONSULTANTS

Computing
Services
Association



061-833 9341/5



3 SYSTEMS CONSULTANTS
C. LONDON
£7,000 + PROFIT SHARING + CAR

A small but active software house based in SW London needs 3 systems analysts for the following major applications. The first analyst needs to have ICL 2803/4 or 1800 QII experience of 4 years or more, to work on a major financial application. The second needs to know the 2860 machine as this involves an interesting MIS conversion and should have stock or production control experience for an ICL 2900 under VMEB, using TP and IOWS. All three vacancies offer attractive working conditions including 4 weeks' holiday and 5 months' sick pay. CW 19/1.

Systems Analysts

SYSTEMS ANALYST
MID-MIDDX. to £7,000

Get totally involved in redesigning, virtually from scratch, all the company's applications for a large Electronics subsidiary of this international organisation. Some of the systems, which will be running on their sophisticated IBM computer, will use the latest DATABASE techniques. With 2 years' or more systems experience (any machine) you will share in the following excellent benefits — removal expenses, flexible, CPS, 4 weeks' holiday, and subsidised canteen serving great food. CW 19/3.

SYSTEMS ANALYST
WELWYN GARDEN CITY to £7,500

An international pharmaceutical organisation with a major investment in the latest IBM DOS/VSE/CICS DLI environment requires a systems analyst with a proven record of systems implementation to work on a variety of business systems. Make a real contribution by joining a company with excellent in-house training and offering relocation expenses, CPS, 4 weeks' holiday, and free BUPA. CW 19/6.

SENIOR SYSTEMS ANALYST
MID-SURREY £8,500

Why not join a company based in a lovely part of Surrey? This major household product manufacturer has a large and sophisticated IBM system and has in view the latest IBM 4341 computer. A senior commercial analyst is needed to work on a range of new sales accounting and on-line order entry systems. Along with relocation expenses, offer company benefits include CPS, 4 weeks' holiday, annual bonus and an active Sport and Social Club. CW 19/9.

SYSTEMS ANALYST
MID-MIDDX. to £7,250

Our clients, who are a major garment manufacturer with an advanced IBM 370 DOS/VSE installation, require a systems analyst who can contribute experience in the manufacturing or commercial systems area. The company uses screen coding and interactive programming as part of its advanced approach to computing, and a career with them would be highly beneficial. Perks include CPS, 4 weeks' holiday, a subsidised canteen and staff purchase scheme. CW 19/4.

SYSTEMS ANALYSTS
N. LONDON to £7,000

One of the most famous Finance houses in the country using IBM mainframes, is seeking young systems analysts wishing to enlarge their previous 2 years' systems experience and office and facilities they can offer 4 weeks' holiday, Non CPS and subsidised canteen. Your particular machine experience is not important, neither is a programming background essential. CW 19/7.

SYSTEMS ANALYST
MID-SURREY £8,000

This vacancy is for the above mentioned company with latest IBM 4341 computer on order. The post of systems analyst could suit an analyst programmer who wishes to progress into straight systems design. Here a manufacturing background would be an advantage with a minimum of 3 years' DP experience. CW 19/10.

SYSTEMS ANALYSTS
N. LONDON to £8,500

Our clients, based in N. London, are one of the most successful manufacturing and exporting companies in the UK. Being manufacturing oriented they have a variety of systems on their IBM 370 which incorporate the use of DLI/1 and IBM's COPIES. If you are interested in this side of DP and want a job with a future, contact us now. They offer relocation expenses, CPS, 4 weeks' holiday, and an annual bonus. CW 19/8.

SYSTEMS ANALYSTS
SLOUGH £5,500 to £8,000

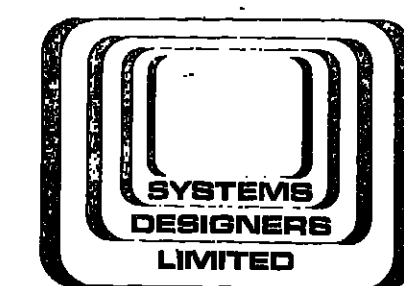
Join this growing internal services department of a major household and industrial products organisation. Having the latest ICL 2904 plus Datapoint mini computers, this company can offer a really great future. A manufacturing background would be advantageous without necessarily having programming experience. Perks include relocation expenses, 4 weeks' holiday, CPS, and a subsidised canteen. Full training will be given and promotional prospects are excellent. CW 19/11.

JUNIOR AND SENIOR CONSULTANTS
£ NEGOTIABLE CENT. LONDON

So large, well-established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require first-rate service. Technical Communications Consultants are also required where on-site implementation experience of IBM or DEC latest range essential. Excellent fringe benefits and prospects. CW 19/2.

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UNIVERSAL COMPUTER ASSOCIATES LIMITED

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Data Express House, 3 Prospect Place, Heathfield Terrace, Chiswick W.4.



Quality first

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Systems Designers Limited needs computer professionals at all levels to work in very nearly every field of computer operation, not only in the UK but also in Europe, the Middle East and the USA. Although a large amount of work is centred around our Camberley, Frimley and Manchester offices there are many long term projects which offer opportunities to see other countries throughout the world.

Our continuing requirement is for staff at all levels. We are looking for final year graduates as well as experienced software and systems professionals. Salaries are negotiable up to £12,000 p.a. according to ability and experience.

Systems Designers controls and encourages the career progression of its staff giving them a wide variety of experience of both project applications and computer systems.

The company runs productivity bonus, insurance and pension schemes and offers assistance with relocation.

Telephone Ann Gregory for an application form and further information about the company or write to:
Bill Hockey, Operations Director, Systems Designers Limited
1 Pembroke Broadway, Camberley, Surrey GU15 3XH
Telephone Camberley (0276) 62244

Systems Designers Limited has an unrivalled reputation in modern computer technology as applied to mini and micro computers in real-time environments. This reputation is resulting in a company-wide expansion plan, which offers plenty of opportunity to the right people. We are British, independent, currently 200 strong and confident of a successful, exciting future.

Our principal work areas are currently:

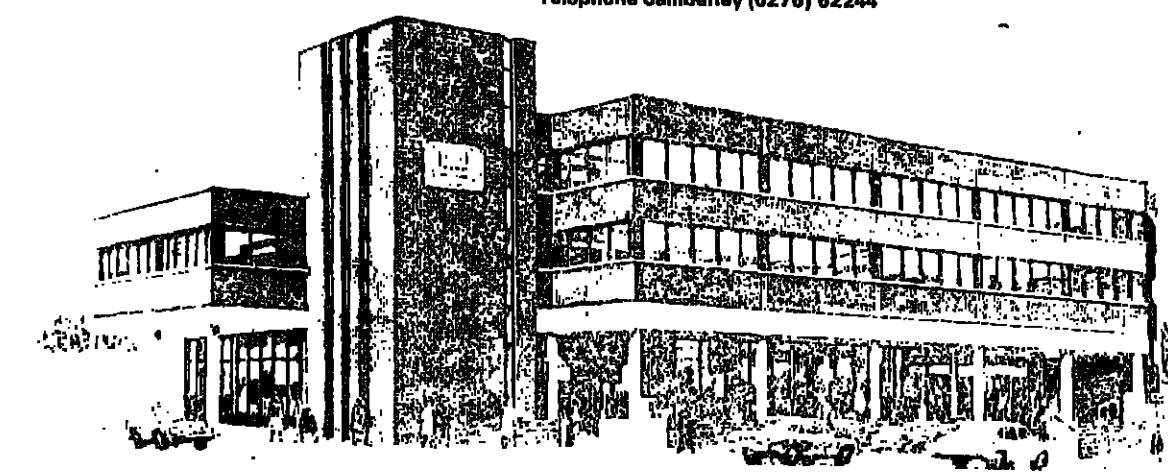
COMMUNICATIONS: Message switching, telex systems, Communications management systems, computer communications.

INDUSTRIAL: Process control and monitoring, plant control simulation, high speed data analysis, distributed microprocessor systems.

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SOFTWARE PRODUCTS: Compiler technology, software design techniques, MASCO, information processing systems, STATUS and VIEWDATA systems.

CONSULTANCY: Complex military systems software and systems development technology.



CHELMSFORD BOROUGH COUNCIL

COMPUTER PROGRAMMER

Post No. 19

Salary Range £4,245 to £5,073 p.a.

The Council requires a man or woman with at least twelve months' programming experience in RPG, Cobol or other high level language. The appointment will be made at a point on the scale corresponding to the successful applicant's qualifications and experience with progression to the maximum by annual increments subject to satisfactory service. The annual pay award for local government services is due on the 1st July and this will enhance the salary scale offered.

Housing accommodation will be considered in suitable cases and the successful candidate, if he needs to move, can benefit from the payment of removal expenses and certain other resettlement allowances.

The Council's computer is a Univac 80/25 with discs and magnetic tapes and it is currently being upgraded with the addition of a V.D.U. and extra store. An interesting variety of applications is being handled, and the successful candidate will play a part both in the development of on-line facilities and in the preparation of programs for new applications.

Application forms may be obtained from the Personnel Officer, Civic Centre, Chelmsford CM1 1JE, to whom they should be returned by 21st May, 1979.

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Career Specialists and Consultants for
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Our client is a leading member of the fastest growing electronics group in the U.K. They manufacture and market a highly successful and respected range of sophisticated data-communications systems, and are well established as European market-leaders in this field.

In order to keep pace with the success of, and heavy demand for, their powerful range of products and in order to continue the development of the business in forthcoming years, the company is now seeking to enhance its field sales force, and is therefore able to offer a number of unrivalled opportunities to sales executives with the determination and ability to succeed in a demanding yet highly rewarding environment.

The ideal candidate will offer previous experience of selling data communications systems. However, a successful track record in any computer or electronics related field is also relevant, since the ability to communicate effectively with senior management in either technical or general terms is an important consideration.

A comprehensive period of thorough orientation will be given to prepare the appointed persons for success in the field. The substantial base salary is enhanced by a generous commission scheme, which is guaranteed for an initial period, and the provision of a company car. In addition, a valuable range of fringe benefits is offered, including twenty-four days holiday, making these exceptional opportunities to join one of the success stories of British industry particularly attractive.

Ref: SW1/1005

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IBM OS up to £4800
Operators with six months experience are urgently required for companies in Central London and Home Counties.

IBM SYSTEM 3 £3800
Minimum of six months required for financial institution as a junior operator. Good prospects into programming.

ICL 1900 £4800
Operators with 18 months GII + or 24000 experience are required for this busy site in The City. Plenty of overtime available.

ICL 1900 £4500
Operators are required for this site in C. London, 1 yrs. + GII/QII experience required, good perks.

ICL 1900 £3800
Busy installation in The City urgently requires a junior operator with 6 months GII/Manual operating experience. This company can offer excellent career prospects into programming, etc.

DEC PDP 11 £8000
Company in City are looking for a senior operator with 2 yrs. + experience with DEC equipment. Some technical background would be an advantage. Two shifts only.

HONEYWELL GCOS £4800
Surrey site is recruiting operators at all levels. Applications will be considered with other mainframe experience.

DEC PDP 10 £8000
Senior operators with 2 yrs. + experience in DEC equipment are invited to apply for this position offered by a site in C. London. Perks include BUPA and subsidised meals.

UNIVAC £3800
any in S.E. London is currently looking for junior operators. Some experience with DEC equipment would be an advantage. Perks include canteen facilities, Life Assurance scheme and 4 weeks' holiday.

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At Dataskil you are an integral part of the organisation rather than a member of a service department. However successful you are now, we can help you build on this success.

Government Services Department is very successful. Its success is directly attributable to the quality of its staff and complexity of the projects it handles. Our staff work on assignments both in the UK and Europe and on projects which cover the whole spectrum of ICL equipment from the tried and tested to the 'just announced'.

We are looking for programmers, systems programmers, systems designers, project leaders and senior consultants. We will base you in Cardiff, Bristol, Reading or London to suit your preference and to ensure minimum disturbance to your domestic life or life style.

The experience we are looking for falls broadly in the following categories:

2-4 years experience
£4000-£5500

People experienced in 2800 and 1800 COBOL, Fortran and/or 2803 RPG2 and COBOL. There could also be vacancies for graduate trainees who have spent 1-1½ years as trainees with a manufacturer and now want to move over to development work.

5-8 years experience
£5500-£7500

Similar experience as before, but with a greater depth of experience in complicated applications development projects, probably as a designer or project leader. There are also vacancies for systems programmers with large operating systems experience. George 3 for example or TP systems.

8 years +
£7500-£12,000

Here we are looking for people prepared and able to act as consultants whether in the area of applications development or software programming and/or on-line and TP systems.

If you are interested please phone: Gerry Grundy, Mahen Tampoe, or Tony Curran at Reading (0734) 581258 or write to one of us at: ICL Dataskil, Reading Bridge House, Reading, Berks RG1 3PN. Please quote reference CW 1375.



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£13,000 in your first year and rising

Our clients, who have achieved, in a few years, a leadership position in one of the world's fastest growing industries — word processing, are ready to offer you the opportunity of on target earnings of £13,000 p.a. plus co. car and usual large company benefits, from a very good basic salary; selling, at all levels, their computerised screen based systems.

Territories currently available and now needing more extensive penetration are Scotland, Leeds, Birmingham, Central London, S/W and S/E England.

Successful applicants will be between 25/40 resident in the above areas. A proven track record in sales essential, sales experience in W.P. or D.P. advantageous.

Telephone for a confidential appointment with Margaret Donnelly on 01-629 7262 at:

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SMA

Data Processing Manager

Hi-Fi Distributors, c.£9,000 plus car

Our client is a highly successful and rapidly expanding distributor of high fidelity and associated equipment in the United Kingdom. At their head office and principal warehouse in Buckinghamshire they are beginning the development of their existing Burroughs B-80 system to meet the needs of their rapidly growing business. They wish to appoint a Data Processing Manager to develop their data processing activity and control their existing systems whilst this is taking place. This is an exciting opportunity to create a department almost from scratch and take an active part in the company's growth. Applicants, aged 28-35, should be graduates or have an equivalent professional qualification, with exceptionally relevant experience. They should be familiar with Burroughs or other manufacturers' systems. Experience in a distributive trade and associated financial systems would be an advantage. They must be prepared to take an active part in all levels of the data processing function, but the main requirement is for a person who is capable of offering sound advice on the most effective means to be employed. This is a unique opportunity for someone to develop their design, development and managerial skills. Salary will be negotiable around £9,000 per annum, a company car will be provided, and there is the usual range of other company benefits. For an application form, men and women are invited to write or telephone in confidence to Geoffrey Laycock at the address below (telephone 01-229 6742) quoting reference No. 600/CW.

For an application form, men and women are invited to write or telephone in confidence to Geoffrey Laycock at the address below (telephone 01-229 6742) quoting reference No. 600/CW.

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Computer and Selection Consultants

9 Manmouth Road
London W2 4UT

SYSTEMS

OUTSTANDING CAREER OPPORTUNITIES AT S.E.L. COMPUTERS LIMITED FOR EXPERIENCED FIELD ENGINEERS AND SUPPORT ANALYSTS

THE COMPANY — S.E.L. Computers Limited, a fast growing and leading supplier of high performance 32-bit mini computers for the most advanced technical and real time applications, with headquarters in Fort Lauderdale, Florida, has a well established operation in the U.K. and an impressive list of customers in Aerospace, Government, North Sea Oil, Industry and Electricity and Gas supply.

Our rapid growth means we need:

FIELD ENGINEERS: ALL LEVELS £5,000-£7,500 — CAR — NORMAL BIG COMPANY BENEFITS

Applicants must have at least eighteen months' experience in a computing environment, preferably in high performance mini or mainframe computers, with training in OEM peripheral, Persec equipment, Data Products and Control Data disc.

Location: Kingston, S. London, N.W. London and Surrounding Area.

SUPPORT ANALYSTS: £5,000-£11,000 — CAR — NORMAL BIG COMPANY BENEFITS

Experienced software professionals are required for pre and post sales support. A background including in-depth knowledge of operating systems, compilers and general scientific computing is desirable. In addition to support of S.E.L. products, these posts offer an opportunity for involvement with the latest developments in a wide range of technical application areas.

Location: S.W. London.

Men and Women interested in joining this young and expanding company, please: 01-643 8020 — or write with career details to: Mr. M. Woolger — Engineering
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S.E.L. COMPUTERS LIMITED
RAFFETY HOUSE, 3RD FLOOR
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Career Path From Operations... ... Into Systems Programming

Reigate, Surrey

Good Salary +
Excellent Benefits

This is a unique opportunity for an Operator, Senior Operator or Shift Leader to break out of operations into Systems and Software programming, tuning and amending IBM software, writing in-house software etc.

The client, a professional organisation, is transferring onto IBM equipment, initially an IBM 370/125, eventually a 4341, possibly under VM/CMS. The successful applicant would work closely with the Systems Programmer who has extensive IBM experience. Whilst relevant IBM experience would be useful, we feel this opening will suit a person of good academic standard, with an aptitude for programming, of smart appearance and with a professional attitude.

We strongly recommend this position, for more details or an initial discussion, write, return the coupon or telephone the number below. Positions open to male and female applicants. Quote ref: CW130 ST.

Please send me more details of the Junior Systems Programming position.

Name _____

Address _____

Home Tel. No. _____

Work Tel. No. (Used Discreetly) _____



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Electronic Engineers: Would you know a good idea if you saw one?

Benjamin Franklin really knew what to make of a good idea when it struck him. If you do too, then we'd like to hear from you. Because we're looking for people to get some great ideas off the ground at our production unit in Rugeley. With the help of our expanding development teams we're moving into completely new areas, utilising the very latest in micro-electronics technology.

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We're looking for someone with proven ability in one or more of the following areas: PDP 11 ASSEMBLER, CORAL 66, FORTRAN, RSX 11-M, INTEL 8080 FAMILY ASSEMBLER.

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We're based in a pleasant part of South Staffordshire. The housing is reasonably priced. And if you have to move we'll really help with the expense.

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Applications are welcome
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SYSTEMS ANALYST

(Salary £10,000 to £14,000 per year)

THE COMPANY

Intercontinental Transport (ICT) BV consists of a group of companies which, under the name INCOTRANS, is involved in all areas of transport. Thanks to our specialised know-how and experience the Incotrans group can effect all types of transport, such as ocean transport, coast traffic, river shipping, road transport and air transport. To complete our services we can also offer our clients extensive facilities in stevedoring, factoring, warehousing, insurance and documentation.

THE JOB

We are inviting applications for the position of EXPERIENCED SYSTEMS ANALYST in our Rotterdam Electronic Data Processing Department. The systems development department works via R.J.E. to an IBM 370/148 in Gothenburg. For the real-time system SPEED we are using four connected Data General Eclipse computers (4 x 256Kb, 8 x 200Mb discs), placed in Rotterdam, Antwerp and Bremen.

QUALIFICATIONS

The applicant who will primarily work with the SPEED development should be fully acquainted with E.D.P. matters like

"data bases" and "distributed systems." The computer language used in Incotrans is "COBOL." Candidates with shipping experience are preferred.

WHAT WE CAN OFFER

An interesting position in our office in the world's largest port; pleasant working surroundings; a good salary plus the usual big company benefits and conditions and, of course, our assistance in finding suitable lodging.

YOUR APPLICATION

If you are interested in this job please send your application to the Personnel Department of Intercontinental Transport (ICT) BV, Wilhelminakade 39, 3072 AP ROTTERDAM, Netherlands.

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£4,953-£5,253

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You should be a competent programmer who wishes to gain management experience whilst continuing to develop programming skills. Some knowledge of block structured language would be an advantage. This post which is open to men and women offers responsibility as well as an opportunity to maintain technical proficiency. Thirty-six hour week. Twenty days paid holiday a year.

Application form from the Chief Administrative Officer, North East Surrey College of Technology, Reigate Road, Ewell, Epsom, Surrey, Tel. 01-394 1731.

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COUNTY COUNCIL**

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COLLEGE OF SCIENCE
SHRIVENHAM, SWINDON, WILTSHIRE**

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The Operational Research Branch of the College has a limited number of vacant research posts at Senior Research Scientist/Higher Research Scientist/Research Scientist level. Successful candidates will join a small multi-disciplinary research team working on problems of current interest to the Ministry of Defence and other Government Departments. An interest in computer simulation/scientific programming or scientific gaming is desirable for some posts but an essential requirement is that candidates show a broad and enquiring outlook. Appointment at Senior Research Scientist level requires experience in practical OR, preferably in the application of OR to military problems, plus an ability to lead a research team. Applicants should have a good first degree in any scientific or engineering subject for this grade. Appointments will be for a 2 or 3-year period in the grade of Senior Research Scientist (4 years post graduate experience minimum), salary scale £4101-£5448 p.a. / Research Scientist, salary scale £2838-£4415 p.a. depending upon qualifications and experience. Applications form and further information from the Civilian Admin Office, Royal Military College of Science, Shrivenham, 421 Wilts SN6 8LA. Telephone 0793 782551 (London 421). Closing date for applications 25 May, 1979.

ANALYST/ PROGRAMMER £6-7k ENFIELD

Here is the opportunity to fully develop your skills as a systems analyst.

By joining a small and friendly department you will become involved in a wide range of applications from basic accounting systems through to on-line order entry and stock control. The installation is a Univac 90/30 for which our client intends developing other systems necessary to match their expansion programme.

Our client is a major manufacturer supplying the construction industry with a comprehensive range of nationally known products.

To be considered for this position you must be presently employed as a Programmer/Analyst, be educated to at least 'A' level standard, have been in DP for 4 years or more and gained good COBOL experience.

If you have these qualifications the starting salary is within the quoted range in addition there are re-location expenses where applicable, contributory pension scheme, subsidised canteen and sports and social club.

For full details and an application form please write or telephone to Miss Erica Beresford at these offices—

01-582 2600

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Products and Territories

The successful candidates will be responsible, after initial training, for selling our full range of graphic systems, including plotters, digitizers, controllers and electrostatic systems.

One Sales Engineer will report to our southern area manager, based at Bracknell, and cover London postal, part of Surrey, Sussex and Kent.

The other one will report to our northern area manager and cover the Manchester and Birmingham areas.

Qualifications

We would expect the southern area candidate to live in the designated territory and preferably within reasonable distance of Bracknell.

The northern area candidate would work from home which ideally would be in the Manchester or Birmingham areas.

We would look for the following experience and background:

- 2-3 years selling experience, preferably in the sale of Computer Related products.
- Technical background and an understanding of scientific and engineering computing applications.
- An understanding of Computer Aided Design and Computer Graphics which whilst not being essential, would be a distinct advantage.

Rewards

These are first class opportunities to develop your sales career and grow with an expanding company.

We offer good negotiable salaries, commission, company car and usual big-company fringe benefits.

To apply, please write to, or telephone, Don Crowle, CalComp Limited, Cory House, The Ring, Bracknell, Berks. Tel: Bracknell 50211.

CALCOMP

Analyst/Senior Programmer

To lead a team responsible for the detailed design of interactive and batch mode information processing systems, using a GEC 4070 computer. You should have at least 5 years' experience in assembly and high level languages including FORTRAN IV and you should also be familiar with at least one Operating System and Job Control Language. Experience of multi-access systems and a knowledge of BASIC and CORAL 88 are desirable.

Programmer

For flowcharting, writing and testing of programs, using a GEC 4070 computer. Reporting to the Senior Programmer, you should have a minimum of two years' programming experience in FORTRAN and at least one assembly language. Some knowledge of BASIC and CORAL 88 is desirable.

Please telephone for an application form, or write quoting ref: P/87 to:
Jack Burnie Marooni Space & Defence Systems Ltd., Applied Electronics Laboratories, Browns Lane, The Airport, Portsmouth, Tel: Portsmouth (0706) 699414.

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to work in the

NORTH-WEST

DO you want a significant involvement in interesting projects?
DO you want a variety of work and environment?
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If your answer is

YES!

then you will want to work for Gemini Computer Systems Ltd., part of Europe's largest computer consultancy group.

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For more information about the vacancies currently available you should contact:

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Gemini Computer Systems Ltd.
Roberts House, 80 Manchester Road
Altrincham WA14 4PL
Office: 061-941 1922. Home: 0270 78684



AMBITIOUS ANALYSTS

SYSTIME is one of the most successful companies in the field of mini computers.

Our success in the last six years has been achieved using two important elements. One, a top range of products and back-up facilities and two, by employing only the most experienced and ambitious people in the business.

The inherent enthusiasm and team spirit within the company has enabled us to develop a highly efficient and profitable organisation in which individual talent and drive can earn just rewards.

We are looking for:—

SENIOR ANALYSTS ANALYSTS/PROGRAMMERS in London and Northampton

with good commercial experience in a wide range of applications.

If you have a good knowledge of business systems and/or production control and wish to develop and extend your ability to the full, Systime is the company to work for. Real opportunities exist for you to increase your responsibilities and income.

We offer attractive salaries, bonus scheme, car allowance and a comprehensive benefits package.

Interested? Then contact Chris McDonnell on Leeds 707411 or write with brief details to:

Systime Limited.,
Concourse Computer Centre
432 Dewsbury Road
Leeds LS11 7DF.

SYSTIME

GHANA
COMPUTER MANAGER
c.£17,000 p.a. + Company car
(Ref. V.7)

SYSTEMS TRAINING
MANAGER
c.£12,000 p.a.
(Ref. V.8)

Ashanti Goldfields Corporation
(Ghana) Ltd.

Applications are invited for the above vacancies, which may be of particular interest to computer professionals wishing to progress their career and broaden their experience in an overseas environment.

The installation in Ghana, West Africa, comprises an ICL 1901T, 48K, with EDS 60 and local AVDU's with termiprinters. Installation conversion to 2800 Series is under consideration.

Applicants for both positions should ideally have past experience in a similar size installation, where they have had extensive involvement in systems and programming maintenance and development.

The Computer Manager will be responsible for the administration and day-to-day management of the Computer Department and must be able to oversee all projects and operations by detailed participation.

The Systems Training Manager will be responsible for the design and implementation of system improvements, modifications and development, and will be expected to train local staff in Systems Design, Analysis and Implementation.

Experience of working overseas and possession of formal computing qualifications will be an advantage.

Conditions of service are in line with modern expatriate practice and include:

- 5 year contracts
- 10 month foreign tours with 2 months' leave for the Computer Manager
- 15 month foreign tours with 3 months' leave for the Systems Training Manager
- Family passages each tour
- Provident, gratuity and life assurance schemes
- Staff primary school/education allowances
- Free furnished accommodation
- Good sporting facilities

Please write in confidence, quoting appropriate reference to:—

A. Orchard, Group Personnel Manager,
LONRHO LIMITED,
Cheapside House, 138 Cheapside, London, EC2V 6BL.

Senior Software Designer

Look to the
future with
a market leader
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c £8000

With a turnover last year up 23% to over £500 million, it's easy to see why ICL is Europe's leading computer manufacturer. We move with the times. If you've got the same ideas — an eagerness to grow and the total professionalism to make a name in a competitive business — then a move to our New Products Engineering at Stevenage could pay dividends for us both.

We are seeking an experienced systems analyst capable of designing our new database systems. We want to hear from you if you:

- have proven software design experience
- are self-motivating
- preferably have had experience of PLAN under GEORGE III
- wish to work on these advanced on-line, interactive projects.

Find out today about an exciting tomorrow. Ring Gerry Piper on Stevenage 0438 3361 ext 607. Or write to David Reeves for an application form at ICL, Cavendish Road, Stevenage, Herts SG1 2DY. Please quote reference CWT181.

International Computers

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MINI COMPUTER PROJECT LEADER

Square One's
Data General Division

Salary Negotiable

- ★ Travel Expenses
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- ★ 6 Monthly Reviews
- ★ 4 Weeks Annual Holiday

We are looking for someone to take Project Control responsibility for one of our many varied Mini Computer Projects at our Amersham office.

Applicants must have previous

experience of managing commercial Mini Computer Developments on Data General hardware.

Square One offers above average earnings and a friendly working environment. If you feel you have the background and the capability to take on this challenge then contact Barbara Hawkins on Chesham 75231 or write to her at:

one
Square One
Computer Services Ltd
130 High Street Chesham
Buckinghamshire HP5 1EF

0438

Computer Operator

£70 per week

If you have experience in the use of disk computers, some book-keeping knowledge and a 'GCE' O' level or equivalent education you could join British Airways as a computer operator.

We need a man or woman to operate a Nixdorf magnetic disk computer with a visual display unit at Kershaw House, on the Great West Road, Hounslow. You would be working for the Airways Pension Scheme of which there are 50,000 current members. Other duties would include reconciling computer input and output data and some general accounting duties.

As one of the world's leading international airlines British Airways offers excellent conditions of employment including a holiday pay supplement, subsidised restaurants, index-linked pension scheme, sports and social facilities and favourable holiday air travel opportunities. Earnings incorporate a productivity supplement paid subject to achievement.

If you are interested please phone (01) 897 3246/3247 between 9am and 4pm or write quoting ref. 1940/CW/AG.

Recruitment & Selection, British Airways, PO Box 10, Heathrow Airport - London, Hounslow, Middx TW6 2JA.

British Airways welcomes applications from suitably-qualified Registered Disabled Persons.

**British
airways**

ASSEMBLE YOUR EXPERIENCE BECOME A SPECIALIST AND EARN UP TO £7500

Do you have three years Assembler programming experience to your credit? Then here is an opportunity to progress further and become a specialist as a SYSTEMS PROGRAMMER with a world leader in oil field services.

This position provides an exciting opening for someone who is ambitious with a strong technical bias and wishes to develop into systems programming.

In addition to being responsible for maintaining operations systems software you will assist in selection of hardware and software whilst fulfilling an essential consultancy role concerning database communications systems within the department.

Some knowledge of database and data communications would be an advantage but you will be thoroughly trained in all aspects of the work by the Chief Systems Programmer. The DP department, a young and dynamic one, is at present engaged on many new projects throughout the world and career prospects are excellent so you can expect to progress rapidly. The mainframe is an IBM 370/125 running under DOS/VSE. The department also has an IBM System 34 whilst the 4341 is on letter of intent.

In addition to the salary mentioned you will partake of the benefits normally associated with a major international company. Why not take this chance to progress in a positive direction, and phone or write to Mrs Ann S. Jones, Cripps, Sears and Associates, (Personnel Consultants), Burne House, 88/89 High Holborn, London WC1V 6LH. Tel. 01-404 6701.

Cripps, Sears

City of
Manchester
Treasurer's
Department
Systems Analyst
£5,727-£6,080
including £312 p.a. supplement

An additional post has been created in the City Treasurer's Department to co-ordinate data processing activity in the City's Direct Works Department.

The City operates a large mainframe computer with over 60 video terminals on behalf of all Departments of the City Council. Experience of equipment similar in extent is required.

The Direct Works Department is responsible for maintenance of City Council properties, including over 100,000 dwellings, and is also involved in new building projects and in servicing of lifts and other plant. Stores, costing and payroll work is already done on the computer and the Direct Works Department is anxious to develop quickly into the areas of estimating, resource planning, valuations of work in progress, bills of quantities, etc. A knowledge of the building trade would be a great advantage.

A 35-hour week is in operation, with a flexible hours system, and there are excellent sickness, pensions and annual leave provisions. Assistance with removal expenses may be given.

The City Council operates a Union Membership Agreement under which a new employee is required to become a member of a recognised Union.

Please write to the City Treasurer, P.O. Box 314, Town Hall, Manchester M60 2LR, giving personal particulars and details of experience and qualifications.

LIVERPOOL

Programmer to work
20 hours or more per week

Joseph Parr Ltd. are based in Boyle and have a Data General NOVA computer system with on-line links to remote sites. The company require an experienced BASIC programmer, to work a minimum of twenty hours per week on the maintenance and development of their computer system.

Applications are invited from experienced programmers, with the ability to take on responsibility for the data processing system, interested in a full-time or part-time position.

Contact: Mr. N. T. Cheatham, at Joseph Parr Limited, 372 Stanley Road, Bootle.
Telephone: 081-822 4181 or 081 941 1922.

Joseph Parr Ltd.
372 Stanley Road,
Bootle, Merseyside
L34 5PL

GEMINI Recruitment

1900/2904
COBOL/TABN
WILTS
£210 p.w.
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TABN /
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C. LONDON
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COBOL
PROGRAMMERS
London & S.E. England
Salaries to £7,000
call
MACROLOGIC
(recruitment consultants)
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PROGRAMMERS, OPERATORS
ANALYSTS
For better jobs
VOTE the VIP way!
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New installation Burroughs B800
under C.M.S. Top Salary. Whole
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01-267 0821

SENIOR COMPUTER OPERATOR

Post Ref: PO 34002

Scale from £4313 to £4788 including supplement and shift allowances.

An experienced operator is required to control the operation of an IBM 370/158 (1.5M) computer in a modern purpose-built installation at Watfield.

The system processes a wide variety of job mix, batch and interactive, administrative, financial and technical, centrally and through an extensive terminal network using OS/VS, CMS and CICS, under VM/370.

The Senior Operator will take charge of two operators and be responsible to a Shift Supervisor for the efficient operation of the system. Titles shift are worked between 06.30 hours Monday, and 22.30 hours Friday.

Easy access to motorways and countryside. Relocation expenses may be paid in appropriate circumstances. Excellent recreational and meal facilities.

Application forms may be obtained from the Department of Finance (CAD), PO Box 22, Conner Hill, Watfield, WPI 2DN. (Tel. 07711, ext. 2851) and should be sent by 21 May 1979.

BLACKPOOL
BOROUGH COUNCIL
Borough Treasurer's Department
**SYSTEMS
ANALYST/PROGRAMMER**
(£3,722-£4,832)

Applications are invited from experienced systems analysts and programmers for the position of Systems Analyst/Programmer in the Computer Section. The position is a permanent one with a salary scale of £3,722 to £4,832.

Applicants should have a minimum of three years' experience in the design and development of computer systems, and should be able to demonstrate a knowledge of the principles of systems analysis and programming. Applications should be sent to the Borough Treasurer, Blackpool Borough Council, 100 Victoria Road, Blackpool, Lancashire, PO16 1AA.

METROPOLITAN BOROUGH OF
Rochdale

TRASURER'S DEPARTMENT
(Computer Section)

**SYSTEMS ANALYST/
PROGRAMMER**

A.P. 8/801 (A.735) £5,655
Rochdale is situated 12 miles north of Manchester on the edge of open moorland. An I.C.E. 2880 system has recently been brought into operation and the machine and staff are based in a purpose-built accommodation in New Municipal Office.
The Authority has a wide range of development plans for the next three years. The successful candidate will occupy a vital post in the Systems and Programming Team of the Local Authority. Experience would be an advantage.
Applicants with relevant and other experience may be considered for the position. Full details of the post may be obtained by requesting a leaflet from the Personnel Section, PO Box 110, Rochdale, Lancashire, OL16 1AA. The leaflet may also be obtained from the Personnel Section, PO Box 110, Rochdale, Lancashire, OL16 1AA, or from the Personnel Section, PO Box 110, Rochdale, Lancashire, OL16 1AA.

CUSTOMER SERVICES MANAGER

£12,000 - £15,000 + Car

Location: Home Counties (North)

Our client — who manufactures and markets mini-computers in both OEM and End-user customers — seeks an experienced manager to take control of its field service activities and in-house repair facilities.

He will be responsible for managing an expanding department providing contract and on-call maintenance service for the company's products throughout the UK. In addition, he will manage the repair centre handling equipment sent in from the company's customers and distributors both at home and overseas as well as from its European subsidiaries. Both divisions are expected to run at a profit, and suitable candidates will have demonstrated their success in managing people and controlling resources, probably at branch level in a large organisation.

Interested candidates should submit a curriculum vitae (in total confidence) to:
A. P. BAKER
Management Consultant at the address below

Ref: RW 19/1

PROGRAMMING CONSULTANT

£15,000
UK SOUTH COAST

IBM SERIES I

This opening must represent the most lucrative programming assignment in the UK today.

Hutchinson Scoggins Associates have been retained to find two programmers conversant in BASIC and IBM Series I.

Working for a major international consultancy your future career and prospects are assured. The importance of these posts is signified by the salary indicated which is negotiable upwards for candidates of exceptional ability.

THIS IS THE GOLDEN OPPORTUNITY FOR YOU TO CAPITALISE ON YOUR SERIES I EXPERTISE, DON'T WASTE IT — CALL ME.
GEOFF MARSH on 01-499 4501 NOW

Ref: RW 19/2

SALES SOUTH OF THE THAMES TIMESHARING

£10K Basic Earnings Targets
£25K + Potential
+ Car, Expenses, etc.

There have to be some very good reasons for successful Salesmen to change companies mid year.

Some of the good reasons you can see above, but it is the way you achieve £20K+ that is significant.

- Multiples that double and treble your percentages and no ceiling on earnings
- Up-to-the-minute products including financial planning and database
- First rate technical support
- No frustrating management structure
- Outstanding company growth

Plus, you do not need a timesharing background. If you can sell ideas, that is enough. Check the facts now by calling me, GEOFF MARSH, on 01-499 4501.

Ref: RW 19/3

REAL-TIME SYSTEMS DEVELOPMENT

£ neg'l Berkshire

This company is a small, but fast expanding, software house, backed by a large British industrial concern, which has invested heavily in in-house development and testing facilities.

The main thrust of the business is in real-time systems for large scale control applications. In their chosen field, they are one of the most technically advanced companies in the world — for example, colour graphics feature prominently in their systems.

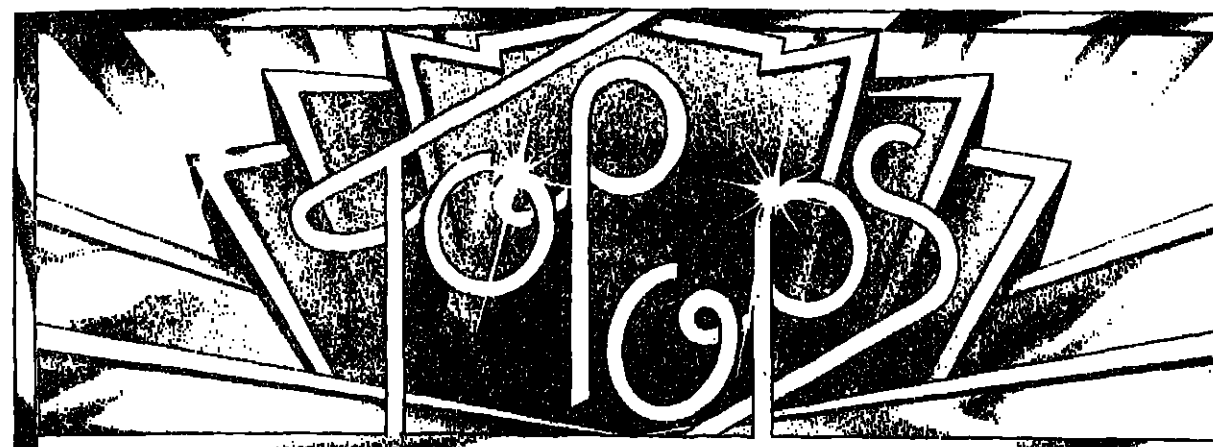
The hardware used has for the most part been DEC PDP/11 range under RSX 11-M, but more and more use is being made of micro-technology (L SI/11, Intel 8085, etc).

If you have programming experience in either high or low level languages, and have an interest in this kind of system, please give me a call. You may well find that the rewards to be gained in this congenial company are very tempting.

Contact: A. P. BAKER on 01-499 3401.

Ref: RW 19/4

hutchinson-scoggins recruitment
47/48 New Bond Street (entrance in Maddox Street)
London W1Y 0HE Telephone 01-499 4501



	YOUR FIRST CONTRACT? Top ops, rely on Knight for advice and development as well as the best jobs!! Call Sue, Jane or June Now!!
New Release	DATA 100 RUE OPS Immediate start. Essex area. Excellent rates. For further details call June, Jane or Sue.
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Contract	ICI 9903/4 EXEC 1 & 2 Varied contracts available. Salary up to £145 per week — Sussex area. Call June, Jane or Sue now!!
Contract	EXPERIENCED KEYBOARD OPS Fantastic opportunity for top level contracts — excellent rates — Min 2 years experience. Call Jane, June or Sue now!!

All vacancies are open to both male and female applicants.

Phone anytime, or for an application form leave your name and address with our answering service.
Knight Computer Services Ltd.
14 Old Park Lane, London W1Y 4NL.
Staff Services Division of BCC Datacube Group and
a member of Computing Services Association.
01-491 4706 OR WHEN BUSY 01-439 3411.

MYRIAD TRAINEE BUSINESS ANALYSTS

WEST LONDON AND CITY
c. £4,500 + BONUS

A rapidly expanding international organisation offering advanced software products is seeking additional staff at junior levels to join the company and be trained as Business Analysts. The successful applicants will function in both a programming and design capacity and will have the opportunity of gaining experience with powerful database and financial software techniques.

Applicants should offer a good academic background together with commercial experience gained in a computing environment. Personality and the ambition to succeed, rather than technical ability, is of prime importance to our client.

The company offers an excellent starting salary plus an attractive bonus package, geared to both individual and team performance, of approximately 10%.

Ref: 51/1004

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 (24 HOURS)

Redifon Computers Limited

Sussex

Diagnostic
Programmers

Salary Negotiable
C. £7,000

Software
Programmers

£5,000 — £7,000

A subsidiary of a major British group, Redifon Computers Limited is the second largest British owned computer manufacturer with installations in the UK, Eastern Europe and the Middle and Far East. The company product range includes distributed processing and sophisticated data entry equipment with extensive telecommunication facilities. Product development makes significant use of both mini and micro computers.

There are immediate opportunities for DIAGNOSTIC PROGRAMMERS to work with test programs for new product development, hardware design engineering, field engineering and quality assurance testing. An engineering background, with experience of mini and/or micro computer Assembler languages and the ability to identify and solve problems, both practical and theoretical, is required. Particularly relevant hardware is Intel 8080, Zilog Z.80 and D.G. Nova.

SOFTWARE PROGRAMMERS will need at least 2 years experience of Assembler level programming, preferably with a working knowledge of one or more high level languages. Software for existing and new products is currently under development and opportunities exist to progress into a number of specialist areas.

The package offered includes an excellent starting salary and a number of benefits including, if appropriate, an excellent relocation package.

Positions are open to male or female applicants. Please telephone (24 hour Ansaphone) to discuss or write to our CROYDON office, quoting ref: CW 136-9J.

COMPUTER AND
PROFESSIONAL
PERSONNEL
CONSULTANTS



CAPP ASSOCIATES
LONDON AND MANCHESTER



01-686 9693
A.M.P. HOUSE, DINGWALL RD.,
CROYDON, CR9 2AU

OPERATORS—BIRMINGHAM

An opportunity to move into Programming

Full training provided
£3,500 p.a. plus overtime

Our client, a large engineering organisation, running commercial systems, offers an operator with 12 months' experience the move into programming. For the first twelve months, you would work as an operator, DAYSHIFT only, and then progress into a trainee programming position. During this time, the mainframe will be phased out, and a network of mini computers, using database and realtime techniques, will be implemented.

Full training on programming this new up-to-date equipment will be provided, and opportunities to then progress within the programming and systems area will be available.

General conditions include Bonus Payments, PAID OVERTIME, Pension Scheme and regular reviews.

This is a unique position, offering a rare opportunity to progress into programming. For a confidential discussion, please telephone Mike Hessian (021-632 6848). Ref. CW160.

CPC

COMPUTER PERSONNEL CONSULTANTS

4th Floor, The Rotunda
New Street, Birmingham
B2 4PA. 021-632 6848

THE UNIVERSITY OF LEEDS DEPARTMENT OF SURGERY (LEEDS GENERAL INFIRMARY)

Applications are invited for suitably qualified candidates for a temporary post of COMPUTING ASSISTANT in the above Department, to assist in the analysis of studies of malnutrition in surgical patients. Familiarity with SPSS would be an advantage. The appointment will be made for a fixed period of one year.

Starting salary in the range £3,384-£3,834 on the 18 Grade for Other Related Staff (under review with effect from 1 October 1979).

Informal enquiries may be made in the first instance to Mr G. L. Hall, University Department of Surgery, Leeds General Infirmary, Leeds LS1 3EX.

Application forms and further particulars may be obtained from the Registrar, The University, Leeds LS2 9JT, quoting reference number 103/14/42.

Closing date for applications 23 May, 1979.

29 Windmill St.

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MYRIAD

ANALYST/ PROGRAMMER

S.W. LONDON

c.£5,500

This position presents a good career step for an Analyst/Programmer seeking additional responsibility, or a Senior Programmer who wishes to progress towards analysis.

The company has recently made a major upgrade in machinery with the installation of a dual 3 Mb ICL 2960 VME/B configuration and has a countrywide telecommunications network. The Systems and Programming team work to professional standards and the company provides formal training to all members of the department.

The successful candidate can look forward to taking total responsibility for a number of interesting applications, involving user contact at all levels.

Applicants should be self-motivated with sound COBOL programming experience, preferably on ICL hardware, and a background in financial and commercial systems. Benefits include Pension Scheme, Flextime and 3 weeks' holiday.

Ref. AI/1005

MYRIAD APPOINTMENTS LIMITED

30 Fleet Street London EC4Y 1AA

01-353 0981 (24 HOURS)

EDP Operations Supervisor

Switzerland

An important work-wide active international bank requires a capable Operations Supervisor. He will be based in Switzerland and be Chief Operator in charge of the 370/148-VM Control, with VM/370, DOS/VSE, CICS, FJCL, POWER and VTAM. The right man will have had at least four years' computer room experience - one year of which must have been in the capacity of senior operator. A good knowledge of on-line systems, JCL and work control procedures, is essential. With English or French as mother tongue, he should have a working knowledge of German. This is a position of responsibility with much potential. The salary payable is excellent and the other conditions are equally attractive. As this matter is urgent, persons interested should write direct sending curriculum vitae to the address below. Strict confidence is guaranteed.

PA Management Consultants AG,

Kreuzstrasse 26, 8008 Zurich, Switzerland.



A member of PA International

COMPUTER PROGRAMMER/ SYSTEMS ANALYST

Surprisingly, Systems Analysts are scarce in the U.S.A. If you are an experienced analyst, familiar with a large scale Honeywell computer with a minimum of five years' experience of Data Base systems, On Line Systems and knowledge of Cobol language, you are invited to join Sun Chemical Corporation, Cincinnati, U.S.A. An academic or professional qualification is absolutely essential. Reply with details of academic and industrial experience to:

Systems Analyst
Sun Chemical (U.K.) Ltd.
143/149 St. Portland Street
London W1A 6AB

Please include telephone number if available

THE UNIVERSITY OF SHEFFIELD LIBRARY

POST OF ASSISTANT LIBRARIAN

(Automation) Grade IIA

Applications are invited from suitably qualified men and women graduates for the above post vacant from 1 July 1979. Candidates should have some experience of automated libraries, preferably in academic libraries, and preferably some demonstrable aptitude for programming and systems work. The post involves a wide range of responsibilities in the area of Automation, in collaboration with the Automation Officer (Dr. R. Clinghagh). Initial salary in range £2825-£4061 on Grade IIA scale rising to £7764 a year. Particulars from the Registrar and Secretary, The University, Sheffield S10 2TN to whom applications (3 copies) should be sent by 14 May, 1979. Closes ref. R 285/79.

Now you can take the money AND open the box!

Project Controller

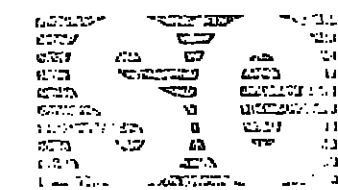
Our Client, the Otis Elevator Company, a profitable member of a multi-million dollar Corporation, wish to increase their Professional Team with a committed Systems Analyst who, working closely with Senior Management, will be responsible for planning, management, and implementation of new Manufacturing Systems.

Our Client, whose Liverpool site includes Engineering Production and Service functions, in addition to the UK Computer Centre, is now entering an exciting phase, with a heavy development commitment, extensive use of the most sophisticated software available e.g. CINCOM and MPS (an MRP System) total and environ and new IBM hardware soon to be installed.

To be successful in this rewarding position, you will require several years in-depth systems experience in a manufacturing environment, coupled with the ability to motivate a committed team of professionals to a common goal.

In return, our Client will pay an above-average salary, generous relocation expenses, pension scheme in addition to normal fringe benefits associated with a large multi-National Company.

FOR FURTHER DETAILS, contact Peter Brown on 061-833 0427 or 0706 65623 (evenings and weekends). or write FREEPOST, SCR Ltd., Blackfriars House, Parsonage, Manchester.



London 01-935 0671 3 Mandeville Place, Wigmore Street, London W1M 5LB
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA

Specialist Computer Recruitment Ltd

SIGNODE LIMITED, SWANSEA

ANALYST/PROGRAMMERS £5K +

We are part of a Multi-National Corporation which leads the field in industrial packaging.

An ICL 2904 disc and tape configuration is installed, with local communications equipment, soon to be extended to include remote locations.

One Analyst/Programmer is required to augment a team covering the design, programming and implementation of production and costing systems and another to join a new team responsible for the introduction of major on-line systems using Telecomputing's T.P.S. Monitor.

Applicants should be educated to 'A' level standard, have had relevant systems experience and have good working experience of COBOL. Company benefits include a non-contributory pension scheme, life assurance plan and a profit sharing scheme.

Swansea is a modern city and is bordered by the beautiful Gower Peninsula. Assistance with re-location expenses may be given.

Telephone Sharon Phillips on Swansea (0792) 34191 for an application form or write to:

The Personnel Manager
Signode Ltd.
Pforestfach Industrial Estate
Swansea

Don't just sit there — Do something!

If you are a programmer or Analyst looking for new opportunities we can help you.

Ring Angela Gallagher on 01-838 6776
COMPUTER PERSONNEL INTERNATIONAL

Glaxo Holdings Limited

Computer Operators

£4000

Islington N1

The Company is the headquarters of an international group of pharmaceutical companies. We are looking for Computer Operators with at least one year's George 11 experience.

The installation uses an ICL 1903T (to be replaced with a 2950 in July) and a HP 3000 series 111 supporting a communication network.

Currently a 3 shift system of working is in operation but it is intended to change to a 2 shift system after the installation of the new machine.

Salary is inclusive of London Allowance, bonus and 3 shift inconvenience allowance. Annual review is due in July. There is a subsidised restaurant and Sports & Social Club.

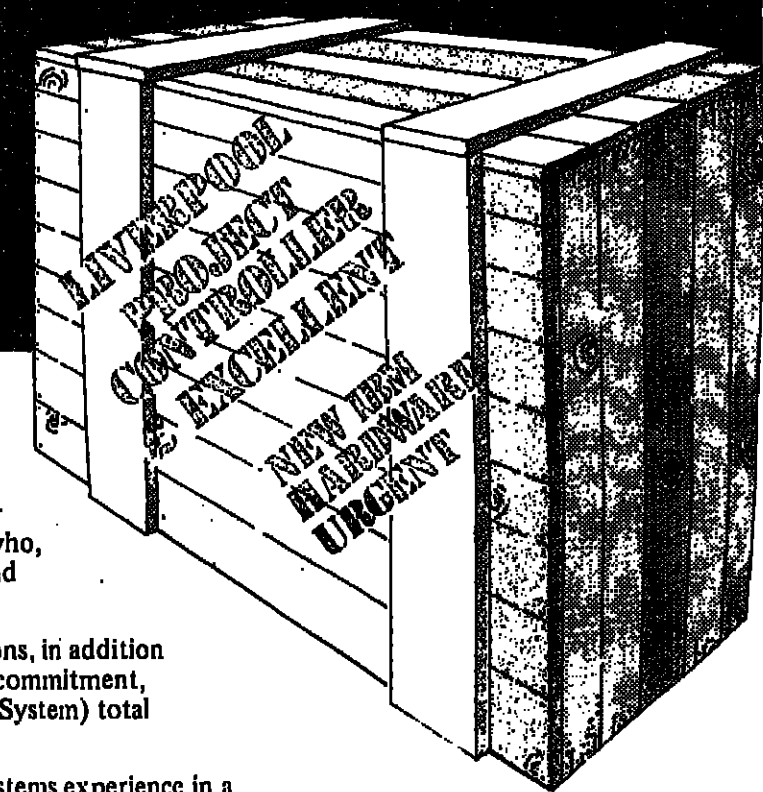
For an application form, please write to:

Miss Sheena G. Ross, Glaxo Holdings Ltd., Graham Street, London N1 8JZ, or telephone Miss Mauna McCann on 01-253 3060, ext. 41.

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring David Abbey for further details on 01-261 8016.



SYSTEMS PROGRAMMER

London up to £6214

British Gas requires a Systems Programmer to join a small team providing software support for large main frame computers. The current in-house computer is from the Univac 1100 range.

This computer provides a bureau service to British Gas Headquarters departments and is also used in connection with control of the National Gas Transmission System.

The team is responsible for all aspects of software support and is also involved on other computer-orientated specialist projects.

The post initially involves the maintenance and development of the Univac 1100 Operating System and other Standard Univac and in-house software, and support to the Operation Section and to general computer users.

Applicants should ideally have a good degree and at least two years' experience as a Systems Programmer using a low level language. Familiarity with Univac 1100 systems would be an advantage, though experienced applications programmers or systems programmers on other computer ranges wishing to widen their horizons would also be given due consideration. This post will be based in Fulham.

Starting salary will depend on qualifications and experience but will be within the range £4429-£8214 (including Inner London Weighting) plus current self-financing productivity payment and the benefits normally associated with a large progressive organisation.

For further details and an application form, contact the Research Secretary, British Gas, London Research Station, Michael Road, Fulham, London SW6 2AD quoting reference LRS/314.

BRITISH GAS



Sperry Gyroscope are among the pioneers in the introduction of Quality Assurance into the development and use of software. We are now expanding our team in this field and we have created an important new position within it. The person appointed will assist in the development and introduction of Software Q.A. Techniques applicable to a number of widely differing projects.

We are looking for an innovative person with a degree, HND or HNC in a relevant discipline who should be:

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OR: Experienced in programming and computer techniques and wish to move into the challenging new field of Software Quality Assurance.

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If you believe that your skill and experience could match our technological challenge why not send us brief details of your self to-day or write or phone for our latest information package to:

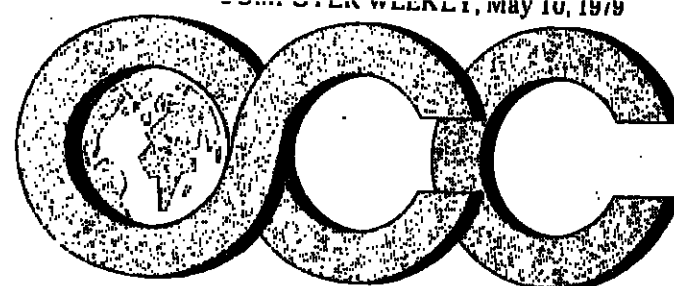
The Engineering Recruitment Officer, Sperry Gyroscope, Downshire Way, BRACKNELL, Berks RG12 1QL. Tel: Bracknell (0344) 3222 extension 818, quoting reference CW10879.

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The Senior Systems Analyst will be responsible for investigating the current share registration system, and developing and implementing a new system. It is a major project and will run on the Hewlett Packard 3000 computer which was installed early last year at the corporate headquarters, Bowater House. The system may employ database and teleprocessing techniques. The Senior Analyst reports to the DPM and will join a small but effective team.

Candidates should have a successful record of achievement in implementing commercial, financial and accounting systems. Experience of share registration systems would be very relevant and could command a higher salary. A good academic background, stable career record and good communication skills are needed.

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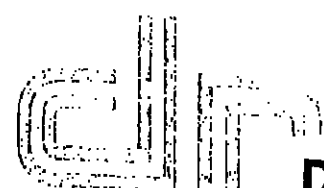
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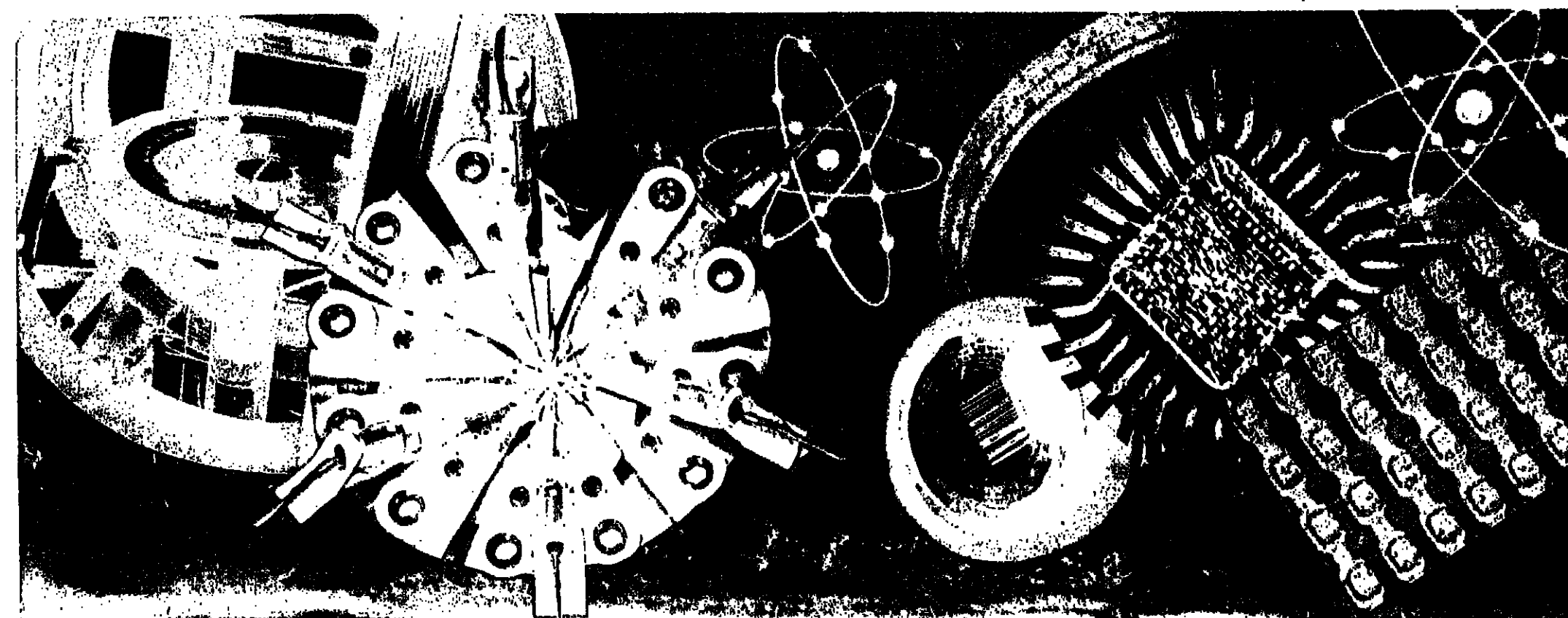
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Starting salaries will be negotiated between £5,500 and £8,000 and generous assistance given with relocation.

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PROJECT LEADER. At least 4 years' Systems specialising in Production and Stock Control applications. Area: Leicester. Salary: To £7,500. Ref: SA224.

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SYSTEMS ANALYST. At least 4 years' Commercial Systems. Area: Wiltshire. Salary: £6,500. Ref: SA204.

SYSTEMS ANALYST. 2 years' Commercial Systems Area: Leicestershire. Salary: To £6,750. Ref: SA224A.

SYSTEMS ANALYST. At least 3 years' ICL Financial Systems including TPS. Area: Birmingham. Salary: To £8,000. Ref: SA213.

SYSTEMS ANALYST. 4 years' plus Commercial Systems. Area: Bristol. Salary: To £8,000. Ref: SA202.

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SYSTEMS ANALYST. At least 2 years' in Programming and Systems Design using Database and Real Time. Area: Nottinghamshire. Salary: c£5,000. Ref: SA215.

PROJECT LEADER/SENIOR ANALYST. At least 4 years' Commercial Systems using ICL Hardware. Area: Birmingham. Salary: c£8,000. Ref: SA187.

PROJECT LEADER. At least 5 years' experience in Systems Design and Analysis with formal Cobol programming background. Area: Stoke on Trent. Salary: To £7,000. Ref: SA227.

ANALYST/PROGRAMMERS AND PROGRAMMERS

CHIEF SOFTWARE PROGRAMMER. To lead small team in support area. At least 8 years' using IBM or Univac Assembler and Cobol. Area: Coventry. Salary: To £8,500. Ref: M49.

PROGRAMMER TEAM LEADER. 3 years' plus PL/1 and Assembler to supervise small team. Area: Birmingham. Salary: To £8,000. Ref: P258.

SENIOR PROGRAMMER/ANALYST. At least 3 years' Programming in Cobol. Area: West Bromwich. Salary: c£8,000. Ref: P192.

SOFTWARE PROGRAMMER. At least 2 years' Assembler with Cobol an advantage. Area: Birmingham. Salary: £5,500. Ref: P410.

SOFTWARE ENGINEER. Micro/Mini computers — some experience in Assembler programming. Area: Nottingham. Salary: Negotiable. Ref: P423.

SENIOR PROGRAMMER. Responsible directly to D.P. Manager. At least 3 years' Cobol. Commercial applications and Software development. Area: Bristol. Salary: c£8,000. Ref: P421.

PROGRAMMER/ANALYST. 18 months' Cobol or Plan. Area: Wolverhampton. Salary: To £5,500. Ref: P338.

PROGRAMMER. 1 year plus any commercial language and experience. Area: Derbyshire. Salary: To £4,500. Ref: P417.

SENIOR PROGRAMMING/ANALYST. At least 3 years' in D.P. to include working knowledge of Cobol MVS and JCL. Area: Birmingham. Salary: £5,000. Ref: P424.

PROGRAMMER. 2 years' plus Cobol and Assembler. Area: Stafford. Salary: c£5,000. Ref: P422.

SUPPORT PROGRAMMER. Required by Mini and Mainframe Manufacturer for Pre and Post Sales Support. At least 18 months' Cobol. Area: Birmingham. Salary: To £5,000. Ref: P418.

PROGRAMMER. At least 12 months' Programming in PL/1. Area: Burton on Trent. Salary: Negotiable. Ref: P367.

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COMPUTER OPERATOR. At least 12 months' operating ICL 1900 under George II Double Day Shift. Area: Birmingham. Salary: To £4,000. Ref: 0187.

COMPUTER OPERATOR. At least 18 months' operating ICL 1900 or Univac hardware. Area: Coventry. Salary: c£4,000. Ref: 0154.

COMPUTER OPERATOR. At least 9 months' operating IBM Systems 3 Day shift. Area: Birmingham. Salary: c£4,000. Ref: 0154.

COMPUTER OPERATOR. At least 2 years' operating IBM 370 under DOS/VSE Area: Birmingham. Salary: c£5,000. Ref: 0156.

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Systems Analysts with good commercial or manufacturing background are sought for a major IBM installation. Real chance for progression. IBM experience not essential.

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Our client will train COBOL programmers with 18 months + for ICL new range TP Data-base developments. Opportunity to join multi-machine installation.

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Analysts with knowledge of programming are sought by a national UK organisation. Financial/Commercial applications.

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Our client needs Project Leaders with in-depth knowledge for major developments. Latest systems. Latest H/W.

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NEW ZEALAND BP

SYSTEMS ANALYSTS AND ANALYST/PROGRAMMERS

THE COMPANY:
BP New Zealand Limited, part of the International BP Group, is seeking experienced Systems Analysts and Analyst/Programmers for their installation based in Wellington. New Zealand. BP New Zealand Limited is a major supplier of petroleum products to the New Zealand market. Other activities include a major partnership in the immense Maui gas fields off the west coast of the north island. As a company, BP plays a major role in the economy of New Zealand.

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The company seeks to recruit up to three experienced Systems Analysts and Analyst/Programmers to enable them to fulfil the commitment of their development programme.

REQUIREMENTS:
* A minimum of five years' experience with a sound background in programming, and at least one year's Systems Analysis experience.
* A Degree or an acceptable tertiary qualification desirable.
* Previous IBM experience preferred but not essential.
* A proven record of achievement in the development of commercial applications, previous on-line experience desirable.
* The personality and disposition to work in a team environment.
* Preference will be given to persons able to travel to New Zealand within weeks of appointment.

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6 Bloomsbury Square
London WC1A 2LP

Telex: 23110 Telephone: 01-242 2142

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ANALYST/PROG.

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Must have 3-5 years' experience with COBOL (preferably IBM) Work is Project orientated and involves the use of 370/158 and 3031 (using CICS). If you are interested in working and/or living in the above areas but your experience requirements do not map on to the above vacancies, then contact us anyway for an informal discussion.

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The University has a large DEC-10 computer system which provides tutorial and batch processing facilities to the University.

The successful applicant will join the operating staff, preferably at the shift leader level, but consideration will be given to others wishing to join at a lower grade.

Applicants must be prepared to work on a two-shift system (Monday to Friday) for which a shift allowance is paid.

Salary scales inclusive of shift allowances are:

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Application forms may be obtained from the Establishments Office, University, Dundee DD1 4HN, and should be returned by May 18th, 1979.

PLEASE QUOTE REFERENCE EST/125/79.

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Phone: Jim Bell or Colin Stott for immediate discussion / interview.

Castle Computer Services Limited
271 High Street, Berkhamsted, Herts, HP4 1BW. Phone (04427) 73151.

Treasury Department

SYSTEMS ANALYSTS

£5,232-£5,568
St. Helen's is seeking applicants who, preferably, possess the N.C.C. certificate or equivalent in systems analysts and who have experience of GEORGE II, PLAN and COBOL. The installation under the control of the Treasurer is an I.C.L. 1902T with 80K store, F.D.S. facilities and a communication system. For further information please contact Mr. J. Barker, St. Helen's (0744) 24081 Ext. 2305.



Written applications should be forwarded to the Treasurer, Chantry House, Marsh Lane, St. Helen's, Merseyside, WA10 1RN, by 24th May, 1979.

Nation-wide opportunities for Freelancers

the facts from...
Vic Groves
Knutsford (0565) 62477
(office hours)
or (0565) 3122

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WORK WHERE THE FUTURE IS...

MICRO PROCESSING

West London Based + Europe & U.S.A.

Our clients, a major International Mainframe Software House, have realised the importance of MICRO PROCESSING. They have subsequently set up a fast expanding Micro Processing division to cope with requests from clients not only here in the UK, but Europe and USA as well.

Therefore we are looking for the following people:
MICRO PROCESSING PROJECTS MANAGERS — to £9,500 with 4 years' + experience ideally in a micro or mini environment but this is not essential. However, you must have experience of Cost Analysis and Feasibility Studies.
MICRO PROCESSING CONSULTANTS from £5,300 to £7,500. Minimum 2 years' + in a micro environment. We would especially like to hear from people who have had Hardware experience of the following machines:

TX 9800, 8502, INTEL 8080, 8085 or Software experience of the following:
PERSONNEL COMPUTERS S/W, PERIPHERAL + COMMS INTERFACE, BANKING, PROCESS CONTROL, AIRCRAFT ENGINEERING MONITORING & DESK TOP INFORMATION SYSTEM.

CW/19/1

LONDON

IBM ICL DEC £5,000-£9,000 + bonus

Are you stagnating in a User Environment?

Then why not keep up with the latest technology working for a Software House.

If you have upwards of 2 years' experience on ICL, IBM, or DEC Hardware, using COBOL, PLAN or BASIC, and have a knowledge of one other language, our clients would like to hear from you. They would be especially interested in hearing from people who have CICS, VME/K or VME/B experience.

This is an ideal opportunity to broaden your D.P. knowledge, as well as earning an excellent salary which will be enhanced by our clients' very attractive bonus scheme.

Get out of the rut today by phoning the advising consultant now!

CW 19/2

SMALL BUSINESS SYSTEMS

West London Sys. 10 + 1500 £4,500-£8,500

A major international Systems House who are better known for their mainframe activities, have a fast expanding Small Business Systems Division.

They have an immediate need to recruit people who range from Programmers with 2-3 years' experience, through to Senior Project Leaders.

We would like to hear from people who have had experience of ASSEMBLER on any machine, and if you have experience of SYSTEM DESIGN, REAL-TIME ORDER ENTRY or ORDER PROCESSING so much the better. Projects are all based on Real-Time applications on the ICL System 10 and 1500 Hardware.

Projects teams usually consist of 2-3 people. The main projects we are recruiting for are SOFTWARE DEVELOPMENT and COMMERCIAL SYSTEMS.

Salaries are well above market rate and the Company can offer excellent career opportunities. Annual bonus, plus usual Company Benefits one would expect from a Company of this size.

CW 19/5

DEPUTY DIRECTOR

CENTRAL LONDON C. £8,000 + car

A unique opportunity has arisen for a DEPUTY DIRECTOR to be responsible for SYSTEMS AND PROGRAMMING, in a medium-size, expanding computer company involved in auto motives and finance industries.

The installation consists of an NCR CRITERION 8570 plus a recently developed interactive on-line communication system using audio response equipment and (ADC 1500) on a nationwide basis, approximately 1000 terminals throughout the United Kingdom. A Data General mini is to be installed early in September.

The person we wish to recruit is likely to be in their mid 30s and will have the following:
SEVERAL YEARS' DP EXPERIENCE
CONSIDERABLE EXPERTISE OF MANAGING ANALYSTS AND PROGRAMMERS
TECHNICAL BACKGROUND PREFERABLY NCR

It would be an added advantage if you have in-depth experience of on-line systems and a programming background in COBOL or near it.

The company can offer an excellent career, and the opportunity to gain more responsibility with the growth of the company.

CW 19/7

Central Computing Consultants

8 Lower Grosvenor Place, London SW1 Telex 27950 Ref. 1035

Telephone
01-834 7105



DOCUMENTATION CO-ORDINATOR

Switzerland up to c. £15,000

We wish to recruit an experienced Technical Writer for a permanent position, with one of our Swiss clients.

The successful candidate will join a large project team, working on up to 30 man years communications systems and will report to the Manager of Software Services. The main responsibilities will include working to tight time scales on the preparation of documentation and literature of the implemented project, for users' purposes.

Candidates must have a proven track record in technical writing and be prepared to work on their own initiative, servicing the needs of the project development teams in a highly progressive company in the communications field.

CW 19/3

HONEYWELL

N.W.3 C. £5,000

Our clients, a National Transport organisation who have their Head Office in Swiss Cottage, have a vacancy for a JUNIOR ANALYST or PROGRAMMER who would like to move over to Analysis.

Their installation is a Honeywell 66/40 running under GCOS and using TDS/IDS. The successful candidate will initially train and gain experience by working with a Contract Analyst, but you will eventually be providing the base of future analytical requirements. It is envisaged that the person selected will eventually become the Senior Analyst.

Ideally, the person we are looking for will be of Degree standard, would either have had programming experience (Cobol on Honeywell Hardware) and some analysis, or a Programmer/Analyst who wishes to become a full-time Analyst.

CW 19/4

IBM SYSTEMS PROGRAMMERS

Paris based + Worldwide Travel
Salaries up to £18,500 p.a.

We have been retained to recruit three Systems Programmers for our client, a very large and influential French Computer Services company. Employing up to 2000 people worldwide, their bureau services are based on numerous IBM machines, ranging around 3031s and 370/168s downwards, in addition to ITEL AS6s and AS6s.

Candidates must have a thorough Systems Programming knowledge of IBM operating systems and software OS/VS1, MVS, VM and CICS, and should be able to communicate with users to advise and support the various systems.

Successful candidates do not need to speak French at present, but will be required to learn the language in due course.

CW 19/6

SPRECHEN-SIE DEUTSCH?

Mini/Software up to £17,500 + benefits

1. Siemens 330
2. Intel 8080
3. IBM DL1/CICS

One of the most prestigious software companies in Europe is currently expanding its operations in Central Germany.

Their business is based on a wide range of projects currently being developed on both minis and Business Machines. Due to this expansion, they want to meet several Computer Professionals who are competent in German, for project development. Technical background can be widespread, but must include software developed on minis. Ideally Siemens and Intel.

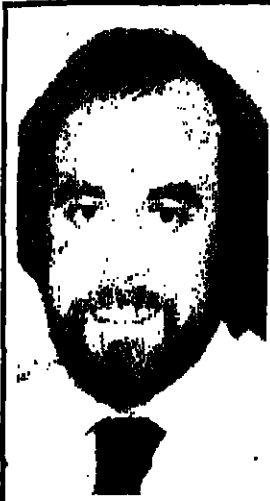
We would also like to recruit candidates with experience of DL/1 and CICS to work on a development project. Systems Programming experience would be useful.

CW 19/8

EDUCATIONAL FEATURE

Training—one of fastest growing areas in DP

By Michael Gough



MIKE GOUGH, sales manager of BOC Datasolve's education department, has held positions as programmer, systems analyst, consultant and engineering services salesman. Here he gives an appraisal of the training scene in the '80s and '70s, based on his own experiences.

the live situation, and what seemed to me better career opportunities, of a user site. I had, however, naively assumed that any training I was to receive would be adequate to the requirements of a commercially accountable environment. It seemed to me that, as any mistakes I made would be costly, the organisation would want to protect its business by training me well. Sadly, I suffered at the hands of a training philosophy which was all too prevalent in the late '60s. It was based on the assumption that reading a user manual would fulfil the requirements of both of us.

Although this was eventually followed by additional in-house training it nevertheless symptomised a widespread lack of awareness within user companies of the value of better trained staff. The start of the '70s saw greater commitment to in-house training, but this was nevertheless hampered by the limitations of in-house experts propounding personal theory from management pedestals, without themselves having been

trained in presentation techniques or an appreciation of the real needs of the situation. One recalls much conscious use of visual aids more remarkable for their unintentional ambiguity than their elucidation of salient points. And more often than not audiences were less than totally committed. The truth of the matter is that the majority of organisations can in no way justify their own dedicated DP training teams, and must look outside for the assistance which most now regard as essential.

Manufacturers themselves provide comprehensive, externally available training which concentrates exclusively, of course, on their own brands of hardware. It is clearly in their interests to invest resources in training the people who will ultimately make their machines in user environments. The availability of suitably experienced personnel should be an automatic consideration when evaluating possible computer suppliers; indeed it may prove the

swaying factor in the prospective buyer's decision process. It goes without saying that they generally train people well. Whether their schemes are totally self-financing is not quite clear. They are very expensive to set up, of incalculable benefit in promoting sales, and in the case of large mainframe manufacturers, essential for in-house and on-going customer training. My own organisation, BOC Datasolve, has itself, over a number of years, had to make a similar type of investment in order to meet the DP training demands of its own departments and of the parent BOC Group, to which at any given time it may be devoting up to 25% of its resources. A policy of investing in the latest hardware has at the same time ensured a continuously high level of activity internally and active interest from a receptive open market.

In addition to DP training, we at Datasolve have also noticed a marked growth in teaching general management skills such as appraisal and interviewing techniques. As always, our universities contribute greatly to preparing graduates for careers in industry—although one is bound to add that a degree of additional training is usually found to be necessary to create an awareness of the harsh realities of working in a production environment. Different, inasmuch as they aim deliberately to inject new staff into the market place, the recently introduced TOPS training schemes are a welcome government innovation.

A dimension of training that is likely to increase dramatically in the future is that of specialised software, the use of which has become more practical with the advent of distributed processing. Offering the student an invaluable hands-on approach to learning a subject, it is a natural supplement to traditional classroom methods. The chalk and talk techniques of a decade ago are rapidly being abandoned in a situation in which the computer is its own best means of ensuring a well-trained future.

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UNIVERSITY COLLEGE, CORK, IRELAND COMPUTER BUREAU

The Computer Bureau provides comprehensive computer services for academic departments and for the college administration. Interactive computing facilities are supported by an IBM 370/138 Computer and Microprocessor-based Systems. In addition a new IBM 4331 is on order for early delivery. Applications are invited for the following permanent posts:

HEAD OF SYSTEMS PROGRAMMING AND SUPPORT (£6,941-£8,282)

The Head of Systems Programming and Support will be in charge of a small high-calibre team responsible for systems development and support. This is a key post and the successful candidate will be expected to play a major role in forward planning as well as providing day-to-day support for current systems. Extensive experience in Systems Design and Programming and the support of Multi-Access Systems is essential as is a mature personality. Preference will be given to candidates with expertise in project management, computer networks or database systems.

SENIOR SYSTEMS PROGRAMMER (£5,911-£6,920)

The Senior Systems Programmer is expected in the development and maintenance of Systems Software including Database and Data Communications Systems. Previous systems programming experience is considered essential for this appointment.

ANALYST PROGRAMMER (£4,842-£5,970)

OR

TRAINEE ANALYST PROGRAMMER (£4,158-£4,278)

The successful candidate will join the applications group. This group will be involved in developing and supporting programmes covering a wide range of academic, administrative and financial systems. The level of appointment is governed by previous experience and qualifications. Applications received in response to advertising of these posts in February 1979 will be considered.

Applications with full curriculum vitae and names and addresses of three referees should be submitted to Establishment Officer, University College, Cork, by Friday, 1st June, 1979. Due to postal delays candidates may telephone (reverse charges), Cork 05063 or 26871, ext. 2602 between 9.30-11.30 a.m. and 3 p.m.-4.30 p.m.

ULSTER POLYTECHNIC Faculty of Science

A number of new posts have been created in the School of Computer Science. The School runs an Honours Degree Course in Computer Science (Data Processing), a Diploma in Computer Education, an HND Course in Computer Studies and BCS Professional Courses. It also contributes to Degree courses in Business Studies, Accounting and other courses at higher degree, degree and diploma level throughout the Polytechnic.

Specialisations which are of particular interest to the work of the School, but are not intended to make up an exhaustive list, are: Data Processing, Systems Analysis, Management Information Systems, Data-base Computation and Theory, Computer Architecture, Operating Systems and Programming Languages, Distributed Computing and Networks, Quantitative Methods, Computer Education and Computer Assisted Learning.

Applicants for the posts specified below should be graduates with relevant industrial experience. Research and consultancy are encouraged.

PRINCIPAL LECTURER OR SENIOR LECTURER — DATA PROCESSING

Four vacancies exist in the areas of Data Processing, Computer Education and Applied Statistics at the grades indicated below.

LECTURER II / SENIOR LECTURER

LECTURER II / SENIOR LECTURER

— FULL TIME TWO YEAR APPOINTMENTS (2 posts)

Salary Scale: Principal Lecturer £7047-£7818 / £8844 Senior Lecturer £6081-£7085 / £7672 Lecturer II £4101-£5058

The Polytechnic is a direct grant institution with an independent Board of Governors. It opened in 1971 and now has a student population of some 7,500. It has extensive new purpose-built accommodation, including 750 residential places on the 114-acre campus overlooking the sea at Jordanstown, a pleasant and quiet residential area. There is a scheme of assistance with removal.

Further particulars and application forms which must be returned by June 4, may be obtained by telephoning Whitehead (0231) 85131 Ext 2243 or by writing to: The Establishment Officer, Ulster Polytechnic, Shore Road, NEWTONABEY, Co Antrim, BT37 0QB.

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THE RAPID RESULTS COLLEGE

Dept. SVS, Tulliton House, LONDON SW19 4DS Tel. 01-847 7272

BIRKBECK COLLEGE

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Mallet Street, London, WC1E 7HX

DIPLOMA IN COMPUTER SCIENCE

A conversion course
for graduates in other disciplines. Two years part-time (evening) or one year full-time.

Full exemption from British Computer Society's Examination is obtained in accordance with the terms of the diploma. Further particulars from the Diploma Course Tutor, Department of Computer Science.

CONTRACT PROGRAMMERS

£200-£240

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INNER LONDON EDUCATION AUTHORITY

COMPUTER PROGRAMMER

RESEARCH & STATISTICS DIVISION

Salary Range: £4,810-£5,943 (Inclusive of London weighting)

A computer programmer is required to work in a small team of 6 programmers providing support to the Research and Statistics Division and other branches of the ILA.

Most programming is in Fortran using the GLE or VDFC pre-processor networks on the GLE IBM 370 computers. Applicants should be experienced Fortran programmers with a degree or professional qualification and a knowledge of statistics.

Further details and application forms obtainable from the Education Officer (EO/Stat 18) Room 267, 10, County Hall, London SE1 7PB. (Please enclose a stamped addressed envelope.) Forms to be returned not later than 24 May, 1979.

BRUNEL UNIVERSITY COMPUTING UNIT OFFICER

PROGRAM ADVISORY SERVICE

A Computing Officer is required to be responsible for the program advisory service in the Computing Unit which consists of two programmes. Previous experience in a program advisory capacity is desirable. Advice is given on the use of machines at ULCC. The University IC machine (in the course of replacement) and a PRIME machine both require packages and help in debugging user programs. Additionally the Computing Officer will be responsible for the documentation and requirements of the User Service Section. The principal language requirement is FORTRAN.

COMPUTING OFFICER

SYSTEMS AND APPLICATIONS PROGRAMMING

A Computing Officer is required in the Systems and Applications Programming Section. Previous programming experience is essential. The Computing Officer will be concerned with the IC machines at ULCC, the University IC machine (in the course of replacement) and a PRIME machine. Training will be given where necessary. Salary is £3,744-£7,145 plus £602 London Allowance. Applications for applications form and further details to the Assistant Secretary (Establishment), Brunel University, Uxbridge, Middlesex UB8 3PH or telephone Uxbridge 27188, extension 48. Closing date: 27 May, 1979.

FERRANTI TRAINING FOR THE FUTURE

Courses include:

- Introduction to Computer Programming
- Introduction to Digital Computers
- Basic software languages
- Coral 66
- Mascal
- Computer Maintenance/Engineering
- Ferranti System Courses
- Microprocessor (System Implementation)
- Specialised Seminars

For further details contact:
MICHAEL GOUGH
DAVID J. LEMSTER
Ferranti Computer Systems Limited,
Watson Road, Blackwell, Oxford,
Telephone: Blackwell 01441 3232

FERRANTI

Computer Systems, Limited



UNIVERSITY OF BATH Systems Programmer Multics

The first Honeywell Multics system in Europe has just been installed to provide computing services to the University of Bath and Bristol. A vacancy exists in the University of Bath Computer Unit for an experienced Systems Programmer to take part in the development and support of this system. Initial duties will include development of high level facilities in the Multics system for support of terminal connections across X25 networks. Experience of systems programming in a high level language or of communications systems would be an advantage.

Salary in the range £432-£7145 per annum. Further particulars and applications from: The Personnel Officer, University of Bath, Bath BA2 7AY, quoting reference number 79/99/CW. Closing date will be 24th May, 1979.

THE OPEN UNIVERSITY

STUDENT COMPUTING SERVICE

COMPUTER ASSISTED LEARNING SYSTEMS

The Service provides student facilities through a nationwide time-sharing network on DEC System 20 and Hewlett Packard 2000 computer systems.

We have a vacancy in the Systems and Programming Group for a Senior Programmer/Analyst — CAL systems. The person appointed will be responsible for the design, implementation and enhancement of computer assisted learning systems. The work will require considerable involvement with academics and educational technologists, responsibility for a small project team and a clear perception of future trends in CAL.

Applicants should have a good honours degree and considerable experience in implementation of CAL systems. Salary will be on the scale £6,317-£7,754 (under review).

Application forms and further particulars are available from The Recruitment Office (JD1812/2), The Open University, P.O. Box 75, Walton Hall, Milton Keynes, MK7 6AL, or telephone Milton Keynes 63404; there is a 24-hour answering service on 63566.

Closing date for applications: 24.5.79

UNIVERSITY OF ABERDEEN

TEMPORARY PROGRAMMER

Applications are invited from suitably qualified persons for above post in Data Processing. The post is tenable for one year in the first instance, but may be extended. An administrative/library computer (CTL 8050) has recently been installed and includes large disk, VDUs and light-pens. The usual applications areas will be library, finance and student records. A knowledge of COBOL is desirable. Salary on Open Related Scale 16 (£3,384 - £5,604) per annum (under review) with appropriate scale.

Further particulars from The Secretary, The University, Aberdeen, with whom application (2 copies) should be lodged by 1 June, 1979.

Q: How many programmers get to grips with a system like this... whilst they're training?

A: Every KBS/TOPS trainee is given this suite of programs to code, debug & system test... and some get as far as amending them too!

... and that's not all

KBS TRAINING SUCCESS IS OWED TO A PHILOSOPHY WHICH PRODUCES HIGHLY ABLE DP PEOPLE WHO ARE CAPABLE OF PRODUCTIVE WORK FROM DAY ONE OF THEIR EMPLOYMENT.

* RIGOROUS SELECTION

Each student gaining a place on our courses has scored well on two aptitude tests, and has demonstrated a high degree of motivation during interviews. Thus trainees are selected for aptitude, motivation and personal qualities which ensure they will stay the pace of the course and prove to be reliable and capable employees.

* INTENSIVE TRAINING

Programming courses last for 18 or 20 weeks depending on the language studied. Each student studies only ONE LANGUAGE (COBOL, BAL or PL/I) and ONE OPERATING SYSTEM. This concentration allows a real IN-DEPTH knowledge to be gained and makes acquisition of another language a simple matter. Training is undertaken in a competitive atmosphere which leads the majority of students to put in many hours of work in their own time.

* PRACTICAL WORK

In addition to a large amount of theoretical instruction, every trainee has the task of writing 14 programs (including the above) which involves flow charting, coding, testing and system testing. Daily testing is available to each student so it's not just knowing how to do it—it's the practical experience of doing it.

Information on course progress is recorded for each student on an individual basis and this is available for inspection by prospective employers. Thus at a glance you can see which students have scored well in the eight exams during the course, and those who have completed all the practical work. Interviewing facilities are available on our premises and course lecturers can provide back-up information on students if required. All these facilities are provided completely free of charge—there is NO COMMISSION of any kind. The past 3 years' recruiting from the pool of skilled specialists it produces.

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COURSES IN OPERATING, PROGRAMMING, ANALYSIS. OFFICES IN LIVERPOOL, LONDON, LEEDS, COVENTRY, CARDIFF.

Let our training take the strain...

If you want the best out of your people, someone has to put the best in—and do it in a way that enthuses, not confuses. That takes experience. People experience, hardware experience, professional training experience. Datasolve's comprehensive training courses are based on more experience of ICL 2900 VME/B and IBM/MVS systems and hardware than probably anyone else has ever accumulated.

BOC Datasolve balances practical and theoretical training. We take trainees to full competence and convert seasoned staff to new environments—in operations, software, systems analysis, programming and APL.

The people problems you have today we've been solving highly successfully for years. Which adds up to a great start if you train with Datasolve—or a lot of old ground to re-tread if you don't. To find out where we're at in your field of training, tick the boxes and post the coupon to: Mike Gough, Sales Manager, BOC Datasolve Education, 9 Rochester Row, London SW1 1LA. Telephone: 01-828 8104.



Send me more information on the following training programmes:

- ☐ ICL 2900 Basic Operations
- ☐ ICL 2900 Advanced Operations
- ☐ ICL 2900 COBOL Conversion
- ☐ ICL 2900 COBOL Programming
- ☐ Systems courses
- ☐ APL courses
- ☐ IBM MVS Basic Operations
- ☐ IBM MVS Advanced Operations
- ☐ IBM MVS JCL
- ☐ IBM Utilities
- ☐ Programming courses
- ☐ Complete Education Packages

Name _____
Title _____
Company _____
Address _____

Just fill in bits

UNIVERSITY OF BRISTOL

Programmer in Department of Anatomy and Computer Centre

COMPUTER OFFICER

Applications are invited for the post of Computer Officer which is a joint appointment in the Department of Anatomy and the Computer Centre. The person appointed will be required to write programs for, and supervise the day-to-day running of PDP 11/03 systems within the Department of Anatomy, and to write programs and give advice to members of the department using the main University Computer which is a recently installed Honeywell 80/60 Level 2 DPS supporting the MULTICS system. The person appointed will be expected to spend the equivalent of 1 day a week in the Computer Centre to gain experience of the MULTICS system so that he or she may be able to advise on its use within the Department of Anatomy.

The main computing task within Anatomy is concerned with the real-time analysis of data obtained from experiments on the nervous system.

Commencing salary within the range £3,883 to £5,804 per annum (scale under review). The University does not issue application forms and applicants should write to Mr. I. T. Parsons, User Support Manager, University of Bristol Computer Centre, University Walk, Bristol BS8 1TW, describing experience and mentioning age, qualifications, and names of two referees as soon as possible. Further details are available on request.

UNIVERSITY OF ASTON
COMPUTER CENTREMSc. Course in
computer science
with applications

This one-year full-time or two-year part-time course starting in October has places for Graduates with a knowledge of computing. The course is accepted by Science Research Council for tenure of its advanced course student ship.

Further details from: Dr. C. H. Hunt, Computer Centre, 15 Colehill Street, Birmingham B4 7PA.

In whom application forms should be returned by 18th June.

UNIVERSITY COLLEGE, CARDIFF
LECTURER

Department of Electrical and Electronic Engineering

Applications are invited for the post of Lecturer in the Department of Electrical and Electronic Engineering. Salary range: £3,883-£7,754. Duties to commence on 1st October, 1979.

Applications (2 copies), together with the names and addresses of two referees should be forwarded to the Vice-Principal (Administration) and Registrar, University College, P.O. Box 78, Cardiff CF1 1XL, from whom further details are available. Closing date 14th June, 1979. Reference 1788.

THE HATFIELD POLYTECHNIC
M.Sc. in INFORMATION SYSTEMS
M.Sc. in COMPUTER SCIENCE

by Part-time, Day-release Study

For further details, apply to:
Mrs G. Tagg
School of Information Sciences
The Hatfield Polytechnic
P.O. Box 109, Hatfield, Herts.
Hatfield HX1 0U, ext. 331

SOUTH WEST UNIVERSITIES
REGIONAL COMPUTER CENTRE
University of Bath

ICL 2980 SYSTEMS PROGRAMMER

The Regional Centre (SWURCC) runs a large ICL 2980 system connected to a sophisticated multi-computer communications network serving universities in Bath, Bristol, Cardiff and Exeter. A vacancy exists in the Systems Development Group within the Operating Systems team. This team is responsible for developing new facilities and providing technical support for the operating system, VME/B. Current developments include a high-level scheduler, message handling software and the connection to the communications network.

The ideal candidate must be willing to become experienced in many areas of VME/B, and to generate solutions to overcome weaknesses in ICL software. 2980 experience would therefore be valuable, as would experience of other large-scale operating systems. Salary will be at a point determined by experience and ability within the range £4,232-£7,145 per annum.

Although we hope that the successful applicant will start as soon as possible, potential candidates who cannot start for several months should not be deterred from applying.

Application forms and further details may be obtained from the Personnel Officer, University of Bath, Bath BA2 7AY, quoting reference 79/26R/CW. Closing date for applications is 28th May, 1979.

THE OPEN UNIVERSITY
DATA
PROCESSING
DIVISIONOPERATIONS PLANNING
Salary up to £6,000

The Open University, founded in 1969, is now a major force in higher education. It has pioneered new forms of undergraduate and post-experience education, and its future plans include developments requiring a similar level of innovation.

Data Processing has been fundamental to the growth of the University and is scheduled to play a major part in its continuing development.

The Operations Planning Section plays a vital role in representing Data Centre interests in the early development of systems, in facilitating the hand-over of newly developed systems for live operation and in supporting accepted systems on a continuing basis.

Applications are invited from persons who have experience of programming and computer system design, preferably with knowledge of Unisys 1100. Career development prospects are good and in addition we offer: good holiday provision; rural location with houses available to rent or to purchase at reasonable prices; sport/social facilities.

Application forms and further particulars are available from: The Recruitment Office (JD2479/2), The Open University, P.O. Box 75, Walton Hall, Milton Keynes MK7 6AL, or telephone Milton Keynes 63868. 24-hour answering service.

Closing date for applications: 25th May.

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PERSONAL SOFTWARE

BSc Computing (part-time)

If you're working in computing then you know it's an industry with a big future. But what about your future? Is your career progressing as quickly as you'd like — or do you need more knowledge and training? The best place to get that knowledge is on the part-time BSc Computing course at PCL. It's a course for anyone involved with computing, mathematics, statistics or operational research in commerce or industry.

Why PCL? The Polytechnic combines comprehensive modern facilities with a long history of excellence in education. Our high standards are respected, not only by employers, but also by Governments and industry.

Why the part-time BSc? PCL is unique in London in offering a day-release degree course in computing. Spread over four years, the course takes up one day and two evenings a week. This allows you to continue your full-time job while acquiring new training. The course gives a good basic knowledge of computing Data Processing Systems Analysis, Hardware, Software Programming, Data Base Design, Management Techniques and Operational Research.

Entry requirements: Normally you will need O'Level A in Maths (including Mathematics, or an O'Level in Science or Engineering, but if you're a mature person with the right experience, these entry requirements may be relaxed. Find out more. For full details of the course, write today to:

The Registry
School of Engineering and Science
115 New Cavendish Street
London W1M 5JB
Tel: 01-489 8811 ext. 241

The Polytechnic
of Central London

UNIVERSITY OF ABERDEEN
COMPUTING CENTRE

The Centre operates a large Honeywell dual processor 66/80 computer with associated peripheral equipment.

Applications are invited for the following posts:

1. **SYSTEMS PROGRAMMER**
To join the team responsible for the development and support of the systems software. Applicants should have a good honours degree in computer science, with proven skill in the development of mainframe operating system software, communication software or microprocessor systems.

2. **PROGRAMMING ADVISER**
To join the team responsible for the development of application software and the user advisory service. Applicants should have a good honours degree in level language. Preference will be given to candidates with experience of Statistical or Numerical Applications and an interest in software package development.

Salary in each case on Grade 1A scale, £4,232-£7,145, rising to £4,333 to £7,251 per annum on 1.10.79, with appropriate grading.

Further particulars from The Secretary, The University, Aberdeen, with whom applications (2 copies) should be lodged by 1 June 1979.

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SOUTHPORT TECHNICAL COLLEGE

Required 1st September
LECTURER 1 Computer Studies

to teach mainly G.C.E. 'O' and 'A' level standard. Applicants should be graduates; possession of teaching certificate an advantage.

Application form and further details from:
The Principal
SOUTHPORT TECHNICAL COLLEGE
Merrington Road, Southport, Merseyside L35 9DT
to whom they should be returned within 14 days of appearance of advertisement.

LANCHESTER POLYTECHNIC AT COVENTRY
FACULTY OF APPLIED SCIENCE
Department of Computer Science

RESEARCH ASSISTANT
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REQUIREMENTS: Preferably having a first or upper-second class honours degree in Computer Science or Electronic/Electrical Engineering with substantial computing content or equivalent. Practical experience in the application of microprocessors would be an advantage.

For application form and job specification please apply in writing, enclosing a large stamped and addressed envelope to the Personnel Officer, Lanchester Polytechnic, Priory Street, Coventry CV1 5FR, returnable by Monday, 21st May, 1979.

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For applications form and job specifications please apply in writing, enclosing a large stamped addressed envelope to the Personnel Officer, Lanchester Polytechnic, Priory Street, Coventry CV1 5FR, returnable by Friday 8th June, 1979.

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